Computing Educators Oral History Project
An Interview with *Beth Simon*
Conducted Tuesday, June 26, 2007
In Dundee, Scotland, United Kingdom
Interview conducted by Barbara Boucher Owens

[**Context for interview:** To be provided]

1 [0:00]
2 **Barbara Owens: This is an interview with Beth Simon of the University of California San**
3   **Diego conducted by Barbara Boucher Owens. This interview is being recorded on the**
4   **26th of June, 2007, in Dundee, Scotland. It's part of the Computing Educators Oral**
5   **History Project. Did we give and pronounce you name correctly?**
6
7 Beth Simon: Yes.
8
9 **O: Good. OK. When we start these interviews, they're kind of funny because we start way**
10   **back when. We're going to talk about your parents. Do your parents have college**
11   **degrees?**
12
13 S: Yes, they were both the first in their families to get college degrees.
14
15 **O: Were they in any kind of computer or math-related fields?**
16
17 S: Yeah. My mother actually did a 5-year degree in nursing and then got a Master's in public

18   health. And my father got a bachelor's degree in math and thought he was going to be a high
19   school teacher. But he found out he didn't like that. And he went and got a Master's degree
20   in computer science at Purdue University in one of the first couple of years that they offered
21   the program there.

22

23 **O: You may be one of the first of the 2nd-generation …**

24

25 S: Yes.

26

27 **O: Were you a good student?**

28

29 S: Yes, I was.

30

31 **O: Did you take courses in math and science?**

32

33 S: I took courses in math and science. And there was actually … I went to a small rural school
34   in southern Indiana, very small town, but it was near Indiana University. But in this small
35   town we actually had a computer science course in my high school. But I did not want to take
36   it because I didn't like … the teacher who gave it was not good at keeping control in the
37   classroom. And all the boys just took it and they played video games and messed around with
38   stuff. But my dad wanted me to study … to try computing. So he bought … we had a
39   computer, one of the few families that had a computer. He bought a Turbo Pascal book, the
40   Borland Turbo Pascal book. And I said, "I won't take the class and do it" (and they were
41   doing BASIC or something), so I did an independent study. I sat in the typing lab, which had
42   IBMs, and I put my Borland Pascal disk in and I probably worked through the first chapter or
43   two, I don't know, in the semester. I would type in the programs and try to fix them. I did
44   that because he made me, you know? He was like, "You're going to do this." And I said,
45   "OK." And it wasn't like there were many other exciting electives to take. So, you know, I
46   was in journalism. I did the newspaer. And I did band and everything else. But the science
47   electives were not great. So that's what I did.

48

49 **O: Did you like … ?**

50

51 S: I did. I really liked it. And what I liked about it was because you would type in a program
52   and it may or may not work, but you didn't have to wait for, like, your math teacher to turn in
53   your homework and tell you whether it worked or not. You just ran it and it would tell you if
54   there was a problem. And the error messages were actually kind of meaningful back in
55   Pascal. So then you'd, like, "Hmm, OK, I can fix something." And so you'd change one line
56   and try it again and it was iterative and you got feedback. And eventually you could win.
57   You would get it right and the computer would do what you wanted it to do which, albeit
58   wasn't much, but it still felt like you won. And so I really enjoyed that part.

59

60 **O: Did you have siblings and … ?**

61

62 S: I did. I had a younger brother and he was about 4 years after me. And he was also a very
63   good student and he was very good in science and math. But he did not want to do computing

64 like my dad. And I don't think my dad pushed him to either. So he went to college and got a
65 degree in journalism.
66
67 **O: OK! You said a non-influence in terms of teacher, or a non-mentor in terms of teacher.**
68
69 S: Absolutely.
70
71 **O: But was there a teacher or someone besides your father early on in life who pushed you**
72 **to pursue this science and math?**
73
74 S: Definitely not. The best teachers at my school that were certainly my mentors and are still
75 close friends were in the humanities: My journalism teacher, my Spanish teacher (I double-
76 majored in Spanish and computer science in college). Yeah, my instructors in math and
77 science were not very supportive. I did have one fellow, who was the physics teacher, who I
78 kind of liked, and he certainly mentored me. But it was a very small town and I was really
79 well-known. I mean, it was just one of those places. Everybody was really supportive. But I
80 would say that overall I had more mentoring from my humanities-side teachers in high
81 school.
82
83 **O: OK. Why did you choose your undergraduate institution?**
84
85 S: Sure. I went to undergraduate at the University of Dayton, which is a private Catholic school,
86 medium-sized, about 6,000 undergraduates. And my dad picked the places that I was allowed
87 to apply for undergraduate. Again, I grew up right next to Indiana University, a large
88 Midwest land-grant state school. But I went to a very small high school. My graduating class
89 was 140 students and only about maybe 15 of us went to college. So, again, very rural, very
90 southern Indiana. And my parents didn't think I would do really well in a big, large class. I
91 mean, I was very shy in high school — very odd to think that now, but it was true.
92 [5:12]
93 And so my dad wanted me to go to a smaller school so I could get individual attention. But I
94 had to have one that had good … decent computing resources. And in early 1990 — I went to
95 college in 1991 — that wasn't an easy thing to get. So he looked around at schools and
96 wanted it close, someplace far enough away from home that I wouldn't come home all the
97 time, but close enough that if I wanted to, I could drive home, like for a weekend or
98 something. So he started looking about two hours away by car, and he picked medium-sized
99 schools that had decent computing programs. I went to the University of Dayton because
100 they were right next to National Cash Register Corporation in Dayton, Ohio, where they are
101 headquarted in. NCR had built them a building and stocked it with a VAX and a bunch of
102 computing … you know, PCs. And so they had good facilities.
103
104 So I went and stayed overnight, and I chose Dayton because they had good food and good
105 showers. And these were really important. You know, everyone on campus seemed very
106 friendly as well. But I … I don't even remember talking to any of the computer science
107 faculty. And I have spoken with them and they don't necessarily remember me from before I
108 was a student. But that's how I picked.
109

110 **O: Well, did you … you knew that you wanted to major in computer science? You said you**
111   **ended up majoring in computer science and Spanish.**
112
113 S: I did. I thought … I enjoyed the time I spent with the computer. My dad sort of — again, it
114   was almost expected — he said, "Well, you can do this. Why wouldn't you major in
115   computer science?" Sciencey things, I like those classes because they're very definite
116   answers, and you could succeed at them, and I knew not everybody else really could. So I
117   wanted to major in computer science, but I also was really good at Spanish, and I had done a
118   study abroad experience in high school. So I wanted to major in both.
119
120   So one of the other things that was key was that I chose a computer science department that
121   was not in a School of Engineering. The University of Dayton has a big School of
122   Engineering, very prestigious, but computer science is in the College of Arts and Sciences.
123   And that way if I wanted to switch or drop majors or switch to chemistry or whatever, I
124   wouldn't have to change colleges within the university. And that was very … I remember
125   that was important at the time.
126
127 **O: Hmm! Well, then you … are there particular people that you can remember in that**
128   **part of your education that were transformative?**
129
130 S: Well absolutely. So I took most of my classes, even though there was about maybe twelve or
131   thirteen faculty in the department there, I took most of my undergraduate classes from one of
132   two people: Barbara Smith and Joe Lang. And they're both still faculty at the University of
133   Dayton, and I see them every year at the SIGCSE Conference, and we catch up. And what I
134   remember, I was also in the honors program at the University of Dayton, which is actually a
135   scholar's program, so they'd have 40 people a year who would apply and get in. And I lived
136   on a special floor in a dorm. And there were three girls in the scholars program who were
137   computer science majors that year. So I remember … you know, they were living on my
138   floor in the dorm, and we would go to … we had like a freshman seminar for people in the
139   major. And I remember I would see them there. Actually there were four girls, because there
140   was who was also — we were honors and she was scholar — so there were four girls on my
141   floor who were also in computer science. And no guys that I knew in the program, who were
142   in honors and scholars who were also in the major.
143
144   So we had pretty much the same class, we had about 25 majors, and we pretty much trooped
145   through classes together. And it so happened we always had either Joe or Barbara for our
146   instructors, and they were really great. One of the best things about my first computer science
147   class was there was a know-it-all guy who had some previous experience — I mean, I guess I
148   had previous experience too, but I didn't … certainly never said that, I don't think, to any of
149   my colleagues or friends in the class. But this guy was one of these know-it-alls who tried to
150   always show off. And the instructor would just [sound of clapping hands] snap down on him
151   whenever he tried to show off in class and pretend to know things he didn't know. And I felt
152   that that was really comforting to me because I was very quiet but then I was getting As on
153   the exams, and here was this guy, and he didn't pass the class. He never made it through.
154
155   And so that … you know, this professor was very … it was a very different experience for

156   me. It was very … it was a new experience, and he was harsh. But I could do it. And I did do
157   it. And then I got to know people and had the same thing, the same professors over and over
158   again, and we had a very strong class. And I've asked them since, I said, "Do you always
159   have so many women who are doing really well?" And they said, "No, you guys were a very
160   special couple of years. There were a lot of especially good students at the time, and a lot of
161   especially good women."
162   [10:03]
163   So I think it was unusual. But we did a lot of things and we had some special seminars, and
164   they were very supportive. And Barbara Smith, specifically, one of my faculty members, she
165   encouraged myself — and there was another very strong girl who was a year behind me —
166   and they encouraged us to go off to summer research experiences for undergraduates. And
167   we both applied to many, and I applied to the CRA-W Distributed Mentorship Program
168   [DMP]. And I was involved in the second year. And my colleague, or my friend, Sarah,
169   minored, she was a year behind me, but I was double majoring, so it took four-and-a-half
170   years because I spent six months in Spain, she went an NSF REU. And we went away the
171   same summer, so we kind of talked. And that was certainly … that was a real experience, that
172   I said, "I can go to grad school, that was really me." So that I knew that I would be doing
173   this. And so that I got into the schools that I did because I worked with Fran Berman at
174   UCSD in the DMP program, and she must have written me letters that said, "You should
175   accept this person," because I applied to thirteen schools and I got into every single one of
176   them, including Texas Austin, and Washington, etc.
177
178 **O: Wow. Would you go back and just tell us what those acronyms, the UCSD … ?**
179
180 S: Sure! UCSD is the University of California, San Diego. So I did an undergraduate research
181   experience there. I ended up going there to graduate school. And that's, in fact, where I work
182   now. I've been other places. And then the CRA-W's the Computing Research Association
183   Committee on the Status of Women. And their project they have is the Distributed
184   Mentorship Project, which is undergraduate women can apply and be paired with a faculty
185   member not in their own institution, someplace else, and go for the summer. I think of it
186   being … you get to be an honorary graduate student. And they really emphasize being placed
187   in a laboratory where you work with graduate students. And I just had incredible mentoring
188   in doing that, and met many graduate students. And it was not so much the technical
189   experience that really made it great for me, but it was the social experience of knowing this is
190   what graduate labs are like, this is what graduate students do. Talking everyday to graduate
191   students. We would go out to coffee all the time. "How did you apply?" "What do you put?"
192   "How do you choose where to go?" "How do you work with an advisor?" "What are the
193   perils and pitfalls?" "How do you succeed?" And that was what gave me, certainly, the
194   confidence that I could make this work.
195
196 **O: So you answered what would have been the next train of thought, how did you decide to**
197   **go on to graduate school. When you decided to go on to graduate school, was your**
198   **thought going straight for the Ph.D. or was your thought Master's degree?**
199
200 S: No, I knew from my experience in this program that the thing to do was to apply for a Ph.D.
201   Because if you apply for a Ph.D., first they pay for your education, you don't have to pay,

202   although that would have been possible for me. But I knew that Ph.D. students were
203   considered … that was where the respect was. That if you come in as a Master's student, it
204   was considered like you were lesser, you didn't have the capabilities — at least at big
205   research schools like the University of California, San Diego, et cetera. The Master's
206   students are not treated with — it's not even just respect, they're just … faculty are focused
207   on working with Ph.D. students.

208

209   There was a really interesting thing I didn't tell you about. The reason I decided to do a
210   summer research experience is somewhere after my sophomore year in college I decide to get
211   a job. And I worked at the National Cash Register Corporation and I hated every minute of it.
212   I was bored silly and they … I remember hauling 286s out of cubicles and replacing them
213   with 386s and I did nothing technical. And I thought, "This is the most boring … how could I
214   possibly do this?" Because they didn't really use my technical knowledge for anything. And
215   I'm sure I just had a bad mentor, and I was in the wrong kind of position. But that was what
216   really pushed me: "I can't do this. I'll be bored the rest of my life, I'll go insane. I have to
217   keep going to school!" That really pushed it.

218

219   But then having the confidence in knowing exactly what I was getting into — how would I
220   have ever known? My parents didn't get a Ph.D., I didn't know anyone who had a Ph.D., et
221   cetera. And certainly not in the sciences. So I really used that summer research experience to
222   find out exactly what it was going to be. And I came back and I said, "This is what I'm going
223   to do."

224

225   **O: Cool. Normally I would ask about your Ph.D. experience, the question of did you enjoy**
226   **the research then? But you already told us that you liked the research experience, but**
227   **more for the social aspect at that time. So as you were in the Ph.D. program and you**
228   **had this expectation for what your research might be like, did you enjoy it? Can you**
229   **talk about it?**
230   [15:08]
231   S: Yeah sure. I did … I certainly did at the beginning. I definitely picked — again, I had a lot of
232   options in terms of going to graduate school. I had fellowships multiple places from the
233   individual institutions, and actually … then I got a National Defense Science and
234   Engineering Graduate Student Fellowship. So I could go anywhere I wanted and I had three
235   years of funding. I didn't have to worry.

236

237   And I picked to go back to the University of California, San Diego, and I did not work for the
238   same advisor, I worked for someone else I had met there, because I picked an *advisor*. I
239   didn't necessarily … I had done some research in areas of interest. I knew I wasn't interested
240   in theory, was more interested in systems, maybe compilers. But I had met Jeanne Ferrante,
241   and I thought, "I can work for her. We can talk. We can communicate." I knew being able to
242   communicate with your advisor was very important to success. And I thought, "I want to
243   work with Jeanne."

244

245   And when I started out I really enjoyed the research that we did. We worked in compilers
246   and, you know, and I was taking my classes. But I have to say as I went along, I worked with
247   two advisors then, I was co-advised by Jeanne and Brad Calder, and like many graduate

248 students I got to the point where I really wasn't very excited about my research, and I didn't
249 find it very personally meaningful. I was developing branch predictors and … I made it
250 through, and I produced a very reasonable thesis. But I would not be what I would say a star
251 student at the University of California, San Diego. They did not expect me to go out into a
252 big research laboratory or a big university and really make a name for myself. Because I …
253 and I don't think I must have worked very hard. I mean, in retrospect I thought I did. But you
254 know, I hated what I did at some point, so you can imagine I probably didn't work a whole
255 lot, get a whole lot accomplished, because I sort of felt like, you know, "Why am I doing
256 this? Who is this going to help? If I produce another branch predictor for a particular
257 computer architecture, no one's ever going to use it. Intel's already done other things that are
258 better. And they can't tell me about them. And what am I going to … how is this
259 meaningful?"

261 So I really … when I went into graduate school, I knew I could do the research, but I thought
262 I wanted to be a professor. I wanted to teach. I'd always been very good at mentoring other
263 students and helping people with their homework. And so I thought, you know, "I'll try out
264 this research stuff," and you have to do it, I knew you had to do it to get a Ph.D. And you
265 need a Ph.D. to get a good job teaching. But I thought, "I'll probably teach some place like
266 where I went to undergraduate."

268 So certainly toward the end of my graduate career, I thought, "I just have to get out of here! I
269 have to finish, so I can go teach." And I did interview for a job that happened to be available,
270 a teaching position in San Diego, a year and a … sort of a little bit before I was ready to
271 defend, and then said, "I won't be available until December." But I was ready to be done, and
272 I just wanted to teach students computer science.

274 **O: Cool. So you continued right away?**

276 S: Yes. So I … yeah, I did my Ph.D. in five-and-a-half years and I defended in December 2001.
277   And I … like I said, a year-and-a-half before, I had — well, two-and-a-half years before — I
278   had seen at the University of San Diego, which is a smaller, medium-sized Catholic teaching-
279   oriented institution, a PUI — a Primarily Undergraduate Institution — I had noticed they had
280   an open position in computer science. But it was two-and-a-half years, I mean, I still had a
281   long way to go. So I didn't apply. But I talked to some people down there, I knew someone
282   in the engineering department — computer science wasn't in engineering — but I had a
283   friend that I ride bicycles with, and she was a professor of engineering, and I talked to her
284   about it.

286   And I contacted the — they have a math/computer science department — I contacted the
287   department head there. And I noticed on their web site they had a brown bag lunch seminar
288   series, and it seemed like there were a bunch of graduate students in the math department at
289   the University of California, San Diego, the big state school I was at, that went down and
290   gave talks. So I emailed this guy, who was the head of the computer science program in the
291   math/CS department, and I said, "Could I come give a brown bag talk?" And he said, "Oh,
292   well that series was last year, but sure, what do you want to give the talk on?" I said, "Well I
293   worked on …" — one of the more interesting side projects I worked on was the Tera-

294   multithreaded architecture, which is now part of CRAY Computer Systems. And I said,
295   "Well, I've got this interesting talk, I could target something at a junior-level audience, could
296   I come down and give a talk?"
297   [19:55]
298   So I did, and of course no students came, but there were all these faculty at the University of
299   San Diego. And I'm really focused, you know, on trying to give something appropriate to
300   them. And they were … I just remember the end of the talk, a fellow shook my hand and he
301   said, "That was very enjoyable. Thank you for coming down. So you're at UCSD, that means
302   you're going to go out and work in research academia right?" And I said, "Well, no, I don't
303   think that's what I want to do." And he said, "Oh! So you're going into industry, right?
304   You're going to go work for Intel?" And I said, "No, no, I really would like to teach." And
305   he said, "Oh! Really? Oh, well we should talk! We should stay in touch!"
306
307   And so I had sort of gotten my foot in the door a little bit. They knew who I was. They had a
308   face, and they had seen me give a presentation. So they knew that … normally, I know from
309   experience now, they think that people who come out of the University of California, San
310   Diego or other big research institutions don't even know what it's like to be at a teaching
311   school and would never want to be there. And honestly, they don't look very hard at their
312   applications. Because they figure, "You wouldn't be happy here."
313
314   So I had gotten my foot in the door and made it clear this is what I wanted to do. And then
315   when they didn't fill their computer science position that year, the next year I said, "Well I
316   still have at least a year to go, maybe two, but I have to apply, just have to do it." Because
317   this is an opportunity, once they fill this position they're not going to have another one
318   available. So I went ahead and put in my application, and I interviewed, and it all went well.
319   And they said, "But when can you really graduate?" And I said, "Well, I really can't graduate
320   by June, but I can graduate by December. If you could wait one semester." And they actually
321   came up and talked to my advisor and said, "Is Beth really going to finish in time?"
322
323   And I heard later (it was a very funny conversation) because — this was not my advisor
324   Jeanne, she was on sabbatical at the time, it was my advisor Brad, and he's a very big name.
325   He's actually left academia now; he's a chief architect at Microsoft. And he said, "Well I
326   think Beth needs to get a couple other big papers at these big conferences." And the program
327   chair of computer science is thinking, "He has no idea what she needs to do to be successful
328   at a teaching institution," and he didn't. He had no experience with any students who would
329   want to do that, and I was always really careful not to emphasize that to him. He didn't
330   understand it, he didn't understand why anybody wouldn't want to go out and be the best
331   researcher they could be.
332
333   But I finished, and I went there, and it was great. I really enjoyed the University of San
334   Diego, it's … you get to know students really well. And you have small classes. Five to … I
335   think the biggest class I ever had was 18 students. And you know, I really enjoyed … you'd
336   have students, again, over and over again, just like I had in my undergraduate. And while I
337   was there I think I must have gotten … there was a really good crop of kids is what I've been
338   told. And five or six of them went off to get Ph.D.s, two at the University of Washington, one
339   at Pennsylvania, one at Texas A&M. And they'd never sent any students to get Ph.D.s

340   before. Three women, and two or three guys. That was really neat.

341

342   **O: Well, you are no longer there.**

343

344   S: I am no longer at the University of San Diego. So I enjoyed teaching there, and I pretty much
345   stopped doing research. I saved a few things from my thesis, and I sort of saved those so that
346   I could have publications that would count for tenure. But after, I didn't really want to do
347   research anymore, so I just focused on teaching. But after a couple of years I realized, I used
348   to study performance. I used to study the performance of programs on supercomputers, the
349   performance of computer architecture. And I realized I actually did care about performance
350   again. But I cared about the performance of my students. And it was very … it was a similar
351   question but it was a different question.

352

353   So I … through an interesting just coincidence, I heard about this tablet PC program, that it
354   will allow you to write on top of your slides in class. And I was introduced to this by a
355   graduate student at the University of Washington, happened to be in town giving a talk. And
356   he said, "But you probably wouldn't be interested in this, because we thought this would be
357   targeted at large classrooms." And I said, "No, this is great, this is exactly what I want!"
358   Because in my classroom I would make PowerPoint slides — I didn't ever write at the board
359   because I'm very short and I can't reach the board and I'm not good at writing on the board
360   — so I would make PowerPoints, which would keep me organized, but I would print them
361   out and xerox them onto overheads. And I'd stand at the overhead and write on them to be
362   more interactive, which is the way … I was modeling what I had seen done as an
363   undergraduate at the University of Dayton.
364   [25:02]
365   And so I thought this tablet thing sounded great! And I had some startup money, so I went
366   out and bought a tablet. And the next week or two weeks I started using the system. And I
367   didn't know I was the first person outside the University of Washington to use this. This was
368   a research project that was being run by Richard Anderson. So I started using it, and I was
369   teaching a computer architecture course that term, and I was, you know, doing all of this
370   stuff. And at the end I thought there was a computer architecture conference coming to San
371   Diego, and I had heard there was going to be a workshop on computer education. And I
372   thought, "I should write a paper about how I've been using this really cool tablet thing to
373   teach computer architecture!" Because in architecture you have these data path diagrams, and
374   it was really useful for me to be able to draw over them with the tablet.

375

376   So I kind of just wrote up a paper, and I emailed Richard Anderson, the researcher at
377   Washington who started it, and the graduate student who had introduced me to it, Steve
378   Wolfman. And I said, "I'd really like to write a paper on my use of your system in an
379   architecture class for this workshop, and I would like to put your names on it, here it is.
380   Would that be okay with you?" And of course now I understand Richard was like, "Oh my
381   goodness! Somebody's already written a paper, and they want to put my name on it! And
382   moreover she's using it and documenting how she's using our system for other architecture
383   educators, and that would be great."

384

385   And at that time basically … so that started it. And Richard started inviting me up to

386 Washington, he paid me, paid my airfare to come up to Washington to talk to him about how
387 I was using his system, and help them further develop it, because I was actually an educator
388 in the field who just picked it up, and I was the first one. And that was the start of everything.
389 Richard mentored me in … I found out you could do education research, I didn't know that.
390 Oh yeah, you can publish. There's these SIGCSE venues, ITiCSE, and he said, "We have to
391 go to these things, and we could write a paper together on how you're using Classroom
392 Presenter in your CS1 class." And a number of things. And he put me in touch with a lot of
393 things.
394
395 And I went to, my first SIGCSE that I went to I was walking around with Richard in the
396 auditorium, and he said, "You need to meet this person over here, Sally Fincher." Sally was
397 recruiting for the Scaffolding workshop, which was a National Science Foundation workshop
398 that was training, as I understand it, taking computer science educators and training them in
399 the basics of education research. And Richard said, "Sally, this is Beth. She's been doing
400 things with me on tablets; you need to have her do Scaffolding." And I put in an application
401 and that really became a turning point for me.
402
403 And so that's what led me to leave the University of San Diego, because I found a renewed
404 interest in research, and I wanted to do research on how students learn, and I wanted to have
405 a real impact with my … on growing understanding of how people learn and how we should
406 make that change in the classroom. And I just didn't feel like I had the time, because I had a
407 heavy teaching load with maybe five to six different classes a year, which is not that bad
408 actually. But I also just didn't have the outreach to students. They had such small classes.
409 And I felt, "I put all this time into really making this great classroom experience for
410 something, and I only reach seven students." And, you know, even if it's seven great
411 students, there's going to be multiple days in the term where none of them want to be there.
412 And that was … I felt like I put such effort into every class, and I just didn't have the impact
413 I wanted.
414
415 So while I was starting to struggle with that, and being frustrated at the amount of effort I
416 was putting in, what I felt I got from it, I decided — I was doing a little work in
417 supercomputing to try to still have a few publications in that area, which are more respected
418 in a small teaching institution than education research, at least in mine. So I went and took a
419 year leave at the San Diego Supercomputer Center, where I had a friend who was running a
420 research group. And he had me in for a year, he had money off a grant for a year.
421
422 And while I was there I made more connections, again with the computer science and
423 engineering department, where I'd been a graduate student. My advisor, Jeanne, had been a
424 department chair for a couple of years, but now there was this new guy there who I'd never
425 really known. And he told … we got talking. I think my advisor, Jeanne, who was now an
426 associate dean, she kind of was saying things like, "Hey, Beth is a really excellent teacher,
427 she's been doing really great things at San Diego," et cetera. And it turns out the University
428 of California San Diego had this really unusual position I'd never even known about when I
429 was a graduate student there, called a Lecturer with Security of Employment. It's a really
430 bizarre title, but it's a faculty senate position, that's like a regular faculty person, but instead
431 of being focused on research it's focused on teaching.

432   [30:05]
433   So at most large research institutions there's three parts to your job: there's research,
434   teaching, and service. But research is by far the most important of those three, and mostly
435   how you're evaluated. A Lecturer with Security of Employment series, the focus is on
436   teaching, professional standing, and service. And professional standing has a very broad
437   definition. You can do some research or you can do curricular development, or just be known
438   in your area in education. But it's education-focused.
439
440   And for example, in the University of California, San Diego, in the computer science
441   department, there are two of these positions currently for a faculty of about sixty to sixty-
442   five. So they're pretty rare. But it turns out they'd been trying to hire someone for three years
443   in this position. In fact, if you remember way back to the fellow named Steve Wolfman, who
444   first showed me the tablet, he was actually in San Diego, it turns out, to do a pre-interview
445   for the position, which didn't ever work out because he had a two-body issue, and it wasn't
446   going to work for him and his wife to both come to San Diego.
447
448   But they had interviewed many people for three years, never been able to hire. And so
449   essentially I was invited to apply. I remember I sat in the department chair's office, and he
450   said to me, "Well, why don't you apply for this position we have?" And I said, "But I already
451   have a job. I'm at the University of San Diego." And he said, "Well, what would you need to
452   want to apply?" And I said, "Oh, well that's a different question. I want a position where I
453   can teach but I can also do education research because I'm beginning to see there's many
454   things I'd like to do with that, and to really have an impact on students." And he said, "OK.
455   We'll define it that way. We'll work it out."
456
457   And so I was very drawn to it because here I would be the expert in the department on
458   education, and I would get the chance to teach lots of CS1, the first computing class, which I
459   was very interested in. And I could reach lots of students, I have classes of 150, you know?
460   And I really, really enjoy that. Because every day you go into class somebody's happy from
461   the effort that you put in. If there's 150 of them, somebody's going to be happy. And the
462   students are very excited, I like having them in the first term, and they really appreciate the
463   effort that I put into my classes. And I found that I could still run very interactive classes
464   where I really felt like I got to know a lot of the students, even with 150.
465
466 **O: Cool. Could you sort of, you have alluded to it a bit, but what's your teaching**
467 **philosophy at this point?**
468
469 S: My teaching philosophy is very much the guide on the side and not the sage on the stage. I
470   have over the course of — I've been teaching, say four to five years in the classroom — and I
471   have moved more and more from an interactive lecture style, where I would present some
472   material and then try to solve problems with students and get them to do that, to this last year
473   I finally embraced full-on. I do only active learning. I do almost no lecture in the classroom. I
474   designed … I looked at … the way I transferred to this is that I looked at my lecture slides
475   about the content that we wanted to get people to understand, especially in beginning
476   programming. And I would say, "Well, I want them to understand how for-loops work."
477   Well, let me design a series of questions that engage them in testing for themselves —

478   students — their understanding of how does this for-loop run? Or how would I build one? Or
479   what's wrong with this for-loop?
480
481   And so my classrooms are just almost a series of problems. Even with 150 students, I start at
482   the front, and it's the beginning and we have an overview slide. And then the first thing we'll
483   do is, "OK, well you read about for-loops in the book" — and they realize they really have to
484   do that before they come to class — and I say, "OK, get together with a friend, with
485   somebody near you, and tell me when we run this for-loop, what is printed at the end?" And
486   then I say, "Go!" And with 150 kids they all start blah, blah, blah, blah, blah, blah, blah, and
487   they talk to each other. And they work on it. And then I yell, "Stop!" And everybody gets
488   quiet again. And through a technology system that we use, students can send in answers
489   electronically, anonymously, and I can start showing those on the overhead. I have a big
490   projector system because it's an auditorium.
491
492   And then students yell out things and I ask for questions and we discuss it. Then we'll do the
493   next thing. Now, "OK, well you tried that, now try to write this piece of code," which is of
494   course much harder. And I do the same thing, I yell "Go!" And they all start working and
495   talking to each other. And if it doesn't get loud enough, I say, "Well, you know you're
496   supposed to talk to each other!" because it's better if they explain it to each other. And then I
497   bring them all back together and we go over examples again that people send in
498   electronically, anonymously, and I can quickly show them. And we show the errors, the
499   common errors, and we show that everybody makes these common errors. And the way we
500   approach it is, "Well, just don't do this on your homework, OK? I'm showing you … it's
501   much better to show you the stuff that doesn't work so that you don't make these mistakes,
502   than to show you correct code." Because they're never going to write correct code the first
503   time. So what good does it do to show them that? You've got to show them incorrect code
504   and how to analyze it and look at it critically so that you can get from incorrect code to
505   correct code.
506   [35:29]
507   So that's my — targeted at CS1 — but my entire teaching philosophy, no matter what class it
508   is, is that me standing up there explaining things to students is very rarely useful, because my
509   … the words that come out of my mouth that may be meaningful to me are going to be
510   interpreted by students completely differently. This is the constructivist learning philosophy,
511   that everyone brings their own understanding and background and brain mindset to any
512   problem. And so you have to let … you have to give people something and let them try it out
513   for themselves, and then you can work with … you can serve as the guide in the classroom to
514   help them interpret correctly or recognize when they're not interpreting correctly how some
515   particular concept or technique works.
516
517 **O: Cool! Thank you. We're going to move into professional organizations. What types of**
518 **professional organizations have you belonged to and how has that affected your career**
519 **so far?**
520
521 S: So, I've been a member of the ACM, the Association for Computing Machinery. I actually
522   joined in high school because my dad thought it would be a good thing to put on my resume
523   for getting into college. And I didn't do much with it in college. We had a local ACM, but

524   again it sort of was like the geeks' club and I wasn't too interested in that.
525
526   But then when I've been a professional, I've been a member of SIGCSE, the Special Interest
527   Group on Computer Science Education, and gone to mostly their conferences. And that has
528   been — again from the very first SIGCSE I attended in Reno, where I met Sally Fincher —
529   I've realized these are invaluable. This is what I have to do. I have to go to conferences and
530   meet people and talk to other people about what they're doing in their classrooms and find
531   research colleagues, colleagues who want to … you know, "Do you want to do a survey on
532   this in the classroom?"
533
534   Or last year at ITiCSE in Bologna, I was at a talk where a person was reporting on pair
535   programming in a first computing class. And there was this discussion at the end, a very
536   famous guy in our field, Ray Lister, raised his hand at the end and said, "Great, we have
537   another paper telling us about the benefits of pair programming in a beginning computer
538   course." And he said, "I just need to ask the audience. So we've reported on a number of
539   things that pair programming's good in CS1. Has anybody reported anything that it doesn't
540   work well or there's problems?" And people said, "Well, no, not really, everything seems to
541   be good." And he said, "OK, for any of you people out there who have done this research, are
542   you hiding anything? Is there anything you haven't told us?" There were a few little caveats,
543   "Well, there's this little thing and that little thing." And he said, "So why aren't we all doing
544   it in our classrooms? How many more research papers will it take before we all do pair
545   programming?" And I thought, "Well, he's right! Why am I not doing this?" And it was that
546   experience through that professional organization, coming to the conference, I put that pair
547   programming in CS1 last year, and I think it was incredibly valuable. And I chose to evaluate
548   it, and report back to my colleagues in a different method than I'd seen anybody else do,
549   which everyone else I've seen has done very quantitative measures of improved student
550   scores, and I've just completed a study where we interviewed twelve students to ask them to
551   compare pair and solo programming experiences.
552
553   And that's where the professional organization is so meaningful to me, because there aren't
554   that many people at my institution who really think as deeply and carefully about learning
555   and computer science education. And when I come to the conferences and the workshops that
556   are supported by my professional community, it's just like coming to a group of friends. And
557   we just talk and everybody's so open. You don't have to know anybody, but you all have this
558   shared experience that you're doing this very hard thing. And that is just invaluable. And
559   that's been what's been the big draw for me.
560
561 **O: In terms of professional … the sort of service. Have you supervised undergraduate**
562   **students or graduate students in their research? And have you — the other question is**
563   **very different — and it's have you volunteered your services to professional**
564   **institutions?**
565
566 S: Sure. So yeah, the first is the students. I have worked quite a bit with undergraduates. I did
567   both at the University of San Diego, I tried to get undergraduates — in the same way that I
568   had — into research experiences, both in the summer, some of them with me at the
569   supercomputer center. And then at the University of California, San Diego, my research

570   projects are pretty much run by undergraduates. I don't … it's not necessarily my intention or
571   even the job of someone in my position at the University of California, San Diego to have
572   graduate students. Although I do have two, which I've co-advised with another person. But
573   their focus is not computer science education because I'm not sure my department is ready to
574   graduate someone who has a Ph.D. whose basic research is in computer science education.
575   So we spin it. It's technology. It's ubiquitous computing. It's software engineering. And we
576   really focus on that.
577   [40:28]
578   And I only have … I've only been there two years, but I do have a student who's in her third
579   year and a student who's in her second year. And they're doing very good things. But again,
580   they have a co-advisor who's a software engineering fellow, Bill Griswold, and he co-
581   advises them. And that lends them some authority. But I really enjoy working with
582   undergraduates, and I have worked probably with ten to fifteen undergraduates in the two
583   years I've been at the University of California, San Diego.
584
585   In terms of … I also have service within the university, in that I use this technology system
586   and I present every quarter at the Center for Teaching Development. I go out and I work
587   within — the University of California, San Diego's organized into undergraduate colleges —
588   and I work heavily with my college, which is the Sixth College, whose focus is culture, art,
589   and technology. And I work with them, helping them hire a chief technology officer, or
590   helping them design courses, et cetera. So I try to be a resource on pilot education. I teach the
591   graduate teaching training methods class.
592
593   And within the larger community, I've served on the board for the Grace Hopper Celebration
594   of Women in Computing as the local chair. I've not yet served in the SIGCSE arena, which is
595   our community. I've been approached, but there are some real restrictions that are a negative
596   for someone in my stage of my career. In that, if you, for example, want to be the chair of the
597   SIGCSE conference, you can't publish for two years. And that's a killer for me. I can't not
598   publish in SIGCSE for two years. It would look very bad. So that's something I have to wait
599   on. I'm very interested in lots of service, but I'm understanding that I need to wait for the
600   appropriate time in my career where I can … you know, maybe I'm not doing quite as much
601   research — I'm in so many research groups right now, distributed across the entire world —
602   and that I need to choose the times when I say "yes" to things.
603
604 **O: Cool. Good! Were there so far, is there — you do so much. Have you found challenges**
605   **to juggle? You have a personal life. I see you running. I know you bike. And you have a**
606   **husband. And all these … love to travel and all these kinds of things. Do you have any**
607   **challenges in making your life balanced?**
608
609 S: Yes! And I keep that very much in mind. Currently I'm in a stage where, very consciously,
610   I've chosen to be career-focused right now. When I moved to the University of California,
611   San Diego two years ago, I knew I was moving to a community that had a lot of resources,
612   and there would be people I could work with, people in education, people in sociology,
613   people in the Sixth College. And so I said, "For a while I'm going to open up a little bit, I'm
614   going to say 'yes' to things that come along." And I knew that at some point I'd need to start
615   saying "no," because I would have too many things going on. And I think I'm getting to the

616   point, certainly if I was staying … if I was going to be at the University of California, San
617   Diego this year, I'd need to be careful, and worry about that balance. Because it got a little
618   out of hand this year. I've got a little too much research going on, a little too much travel.
619   And I just … you know, I want to have a more balanced life.
620
621   I do bicycle a lot. My husband and I bicycle at least three to four times a week. And my
622   travel schedule has been difficult in that way. But it's a choice of … I know that I've been
623   making these decisions and that I can stop at some point. And what's nice about my current
624   position is that I'm definitely overachieving. I know that I don't … I know where the line is,
625   and I know that I'm above the bar. So I can choose to do fewer things. And that's very
626   different, I think, compared to many traditional research faculty positions, where people
627   maybe feel like the sky is the limit and they really have to go all out in order to get tenure,
628   which is the big bummer.
629
630 **O: Have you considered having a family other than just your husband?**
631
632 S: Yeah.
633
634 **O: Do you want to talk, because other young women are interested in that question.**
635 [44:42]
636 S: Absolutely. Yeah. So I personally am not interested in having children. I don't think it has to
637   do with my career choice. I'm not interested in having anyone dependent upon me for
638   eighteen years or however many it is. And my husband and I both feel the same way. We
639   really like kids, and so it really confuses people. Because we're very good with kids. We
640   have a box of kids' stuff at our house for when friends come over with kids. But personally
641   we're not interested. Very interestingly, my mother is very clear that she sees my career as
642   the reason that I'm not having children. We've spoken frankly about it, that this is not in fact
643   the case. But I firmly believe that she does think my career is a major reason I'm not having
644   children. And I have to admit, I would have to make some other choices.
645
646   On the other hand, there is a junior faculty woman in my department who does not have
647   tenure yet and who just had her third kid. And certainly, particularly at the University of
648   California, San Diego, I believe there's really good plans for people having — you can
649   basically have a year off and get full pay. And you can take an extra year on your tenure
650   clock if you want, and that's fine. And I feel it's very supportive in that regard, just not
651   something that I particularly want to do.
652
653 **O: Thank you. In the wrap-up, would you like to tell us what kind of advice you would give**
654   **to a young person — think about that girl in school in Indiana, interested in computing,**
655   **interested in education — what would you tell her?**
656
657 S: Well, I have to say, you may not know you're interested in computing. This was one of the
658   problems. I mean, who really knew what you did as a computer scientist? I mean, my dad
659   was a computer scientist, but I didn't really know what he did. And this is the biggest
660   problem. I think. It's like how … when I wanted to go to college, I saw college as the
661   preparation for going out and having a job. So you should study something in college that

662   you know … you have an idea, "I'm going to go to work each day for the rest of my life and
663   these are the things I'm going to do. And I want to pick something that I think I'm good at,
664   so that I can be successful at it, because that's an important part of being happy." You want
665   to be successful and enjoy what you do every day. And I still didn't know, again, what
666   computer scientists did every day. My dad went in to work, and I thought he did some typing
667   things and he managed programs that tested certain things, but, you know, I never went and
668   followed him for a day at work. Never followed anybody else. It didn't … and it would be
669   hard to even grasp, I think, as just a high school student going around, what do people do in a
670   day as someone who, say, developed software.

672   So you may not know that you're interested in it. But if you like … if you're successful at
673   math problems, and you like solving problems, no matter what kind of problems they are —
674   biology problems or whatever — if you like solving problems, then you like computer
675   science. You may just not know it. And so you should try it! And the problem is I know it
676   doesn't often count for a course towards your degree. But you should try it, because if you're
677   good at it, you have so many people pushing you, you have so much potential for success.
678   Because lots of kids want to be pre-med majors. Lots of kids want to study biology. But if
679   you're good at computer science, all your professors will pay attention to you, and you'll
680   have lots of opportunities. Because not that many people are either interested in it or good at
681   it. So you should try it out. And that can … again, that is probably going to be something that
682   will make you happy. How could you not be happy if people are appreciative of all the things
683   that you're able to do.

685   **O: Cool! Nice advice. At the very end, is there one little tiny story, a short story, that you'd**
686   **like people to say, "Ah, that's Beth!"?**

688   S: The most important thing that I would say to people is that you want to try things when
689   you're thinking about what your career is. You want to try things and not do things because
690   your parents told you to, even though that worked out really well for me. But you want to try
691   things and consider options. And just realize it's okay to change your mind. And to think
692   about the fact that computing has power for every discipline. That, you know, some of the
693   best advances being made in biology, I think, are being made as a result of computing. And
694   that advances in chemistry, everything is … we have this computing focus. So if you can
695   think of how to apply something that you're interested in and computing, or if you … there is
696   real potential there. And you can be a person who really makes a change in our culture and
697   our communities for good, by applying this resource that exists, that honestly is still
698   incredibly under-utilized.

700   **O: Thank you, Beth, and I think you're doing that, and I'm glad you spent some time**
701   **doing that with us.**

703   S: Thank you!
704   [50:00]