Joyce Currie Little
4th October 2006
San Diego, California, USA
Interviewed by Barbara Boucher Owens

B: This is an interview with Joyce Currie Little from Towson State…

J: Towson University

B: Towson University conducted by Barbara Boucher Owens. The interview is being recorded on the 4th of October [2006] in San Diego, California, the United States. It is part of the Computing Educators Oral History Series.

Did we pronounce everything right once we got Towson correct?

J: Yes

B: I usually start as I notice Alison does too from way back when. So let's go back to your childhood. Did your parents have college degrees?

J: No.

B: Tell me more.

J: My father went to Louisiana Tech for one whole week. He came home and said, "Well, that's enough of that. I don't need any more of that." And I think he was the only one that in his family went to college out of the four boys. There were four boys in his family. And my mother graduated from high school and was an honor student but never had an opportunity to go to college. So neither of them did, but they really emphasized study and learning and felt that education was really important and sort of instilled in both me and my sister that we should plan to go to college.

B: Were they interested in mathematics or engineering?

J: My father was a do it all sort of guy, almost like an engineer type of guy who worked on cars, automobiles. He ran the farm and could do almost anything. My mother was not. She was more a literature person, more of a social science type; interested in books and reading and radio, which in the time I was growing up was a big deal. And so my ... one of my uncles was very good, one of my father's brothers was very good in mathematics and so my dad had been told he was very good mathematically but he really never had a chance to study it. So he was interested in the two of us girls, how we reacted to mathematics and so he kind of had a love for that.

B: So tell me more abut your sister and your love for math. Did it start when you were in elementary school?

J: No, actually we were both rather fortunate in this little country town, Pioneer school had multiple grades …

B: In Louisiana?

J: In Louisiana. But, West Carroll Parish. West Carroll Parish and East Carroll Parish were both just across from Vicksburg, Mississippi, and uh, very heavy cotton country. And both of us were fortunate in that the school had such really, really good teachers and they encouraged student even in the third, fourth and fifth grades to excel and they almost always had opportunities for you to rise to the top of your class and do special projects and activities and to especially my fifth grade was really a highlight -- in that we began to, one of our teacher began to have us competing with each other and I wound up competing with three or four young boys who I competed with all the way through twelfth grade.
3:36
And several of us ended up going on to majoring in mathematics. But the real motivator was one of our high school teachers who was an engineer type who had not practiced engineering because he had poor eyesight. He came to teach in high school instead. He was constantly pushing us and pushing us, struggling to have us appreciate the value of mathematics and especially what you could do with it. But of course, I didn't major in mathematics in college at first. I was going to be a basketball coach.

B: Cool!

J: I was going to be a phys ed major. My sister and I also learned basketball through our father. He played baseball and also basketball and his friends and colleagues in his era were also athletic and he even wound up building a basketball court in a pasture on our farm. And so all of his basketball buddies came to play at our house. And the two of us little girls wound up playing with the men. And he taught me how to make a left-handed hook shot that I could make even with a man, grown man, guarding me and so turned out that both me and my sister wound extremely good on our local high school basketball team, and so we were offered scholarships for basketball. And so kind of as a result I majored in physical education when I went to college and I minored in math.

Unfortunately, I got an illness in between my sophomore and junior year and this illness was such that I had to cut back all physical activity. It was a little bit of a shock to everyone on my college campus because health and physical education and discover that one of your basketball people was, has got tuberculosis, was kind of a shock to everyone on campus. It was discovered on one of those mobile buses that comes around and so I switched, I went into a sanatorium, actually for 17 months and when I came back to college after that I was told I couldn't play piano anymore, I couldn't raise windows anymore, I had to be careful with all the motion, so I was not to play tennis anymore; I

had been on the tennis team as well, not to play basketball anymore, and so I majored in mathematics in my last two years.

And then I was hired on campus actually; I was interviewed by a company that came there to interview by one of my physics teachers, and he asked this physics professor if he would indicate if there were any women math majors that were recommended, because they were looking for women math majors. And my physics teacher recommended me to be interviewed and so I had that interview and I got hired that year, my senior year to come to San Diego, California, to work in the aerospace industry. And I asked him what I was going to be doing and "Oh, you're going to be one of our computer gurus, you're going to be trained how to use computers, computation for our low speed wind tunnel." That turns out that was the first job I took.

7:01

B: It was the physics teacher that recommended you, but it was the math teacher that pushed you…

J: It was the math teacher in high school , the 10th grade, 11th grade, 12th grade math teacher was the one.

B: But the physics professor was college.

J: Was college, yes. It was the physics professor was the teacher of my physics class in college.

B: Did you do research with him?

J: No. I guess doing research as an undergraduate wasn't really promoted in those days and there were so few women in math in those days and in physics that when he was asked if he could recommend someone that they could interview in math he recommended quite a few of our people that were graduating, but I guess, I think, I was the only woman that was interviewed. It turns out, I didn't realize why at the time, but later after being at Convair for several years later I found out.

B: Tell us, tell us.

J: Well, it turns out that in the 1940's when the ENIAC was being built at the University of Pennsylvania, for some reason Mauchly and Eckert got women mathematicians to do the programming. And of course there is a lot of talk about whether or not it was because all the men were gone off to war – that was in World War II or whether it was some other reason, but they consistently hired women to do the programming. Yeah, so it turns out the people at Convair had actually done research as to who was going to be active in this new field that was arising. I was hired in 1957 and so it turns out that they had read research, psychological findings and workplace findings that women were supposed to be specially good at detail. And so apparently that is one of

the reasons he had asked my physics teacher, "Do you know any women mathematics majors?" So I guess I was reverse discrimination placed, you know I didn't {talk over} 9:15

B: What was your sister doing?

J: My sister was two years ahead of me. And she was also very good in math, but she loved biology better and so she wound up going off to college at McNeese State in Lake Charles, Louisiana, where my mother's brother lived and his family and she stayed with them and studied medical technology. So she became a medical technologist. She also had an illness that held her out of school for about a year in the middle of her time. She had been sort of diagnosed as a manic depressive, bipolar disorder and it became aggravated in some way and so she had an illness that kept her out a little bit in the middle of her studies as well. So when it came time for me to be graduating, she was already out of school and working. She said, "I've never been to California and Dad said we can take the car if I go with you because he won't let you drive that far by yourself. {chuckles} So we took the car (my dad had provided an old used car) and we drove to California together. After we got out here and I started my job, she decided she didn't want to go home so she stayed in San Diego and worked for many, many years as a medical technologist and she married in San Diego and she still lives out here.

B: Homecoming

J: It is homecoming in a way for her. She lives in La Mesa, not far from here, not far from San Diego, and has had two boys and has been doing very well.

11:03

B: Good. Let me back up a bit. You mentioned that she went to McNeese, but you didn't say where you went or how you chose it. Could you tell us?

J: Oh, yeah. Well, my sister had gone to McNeese State in Lake Charles which is you know about six, seven, eight hours drive away. And I got basketball scholarship offers, all from Mississippi and my dad said, "Oh, no, no. You can't take those, that's to far; that's across the river." And I said well, how about if I go to McNeese State where my sister is. "No, no, no, that's too far. You've got to go to the closest place." And so Northeast Louisiana State in Monroe is the closest place. So that's where I went. Not because I chose it, but because my dad says, "You can't go any further!" So he was a very protective father.

B: When you went to industry you worked out here in California; when did you decide to go back to school and what propelled you?

J: Actually, it was almost right away. In 1957, that is the year that FORTRAN first came out and we had of course been programming in first of all machine language, and then we were programming in assembler. I loved it and I just studied it all the time and would just sit at that old IBM 650 looking at the console, reading manuals while I was waiting for it to run. So I had really studied the architecture and structure and the

programming languages. When FORTRAN came out we had training classes in it, in how to use it, And one of the people at Convair Aircraft Corporation, not at our division, not at the wind tunnel but over in main, what they now call the information technology division, had done a lot of work in using tools, other kinds of software tools and he made arrangements with UCLA extension to offer a class, and I signed up to take his class and I actually got University of California extension credits. That was the first class I ever took that was an official class that was in computing and it was in assembler, and moving on into how a compiler works.

And after that I discovered that even as demanding as our work was, and all that I was learning involved that, a lot was beginning to happen and they were beginning to have courses at San Diego State, and one of the first courses that was mentioned was a course that was in a book by Dan McCracken. And Dan McCracken's FORTRAN manual was our bible. And so I said, "You mean the book is by Dan McCracken and it was called Combinatoric Principles for Digital Computers I got to take that." So I went charging out there to see if I could take it. And in order to take it, I had to get admitted and had to go through some of the other steps and so they said, "Oh we are not sure we can give you credit for this," and I said "Why not?" and they said, "You already know too much. You can probably teach it, but you can sit in, you can audit it." So I wound up auditing Dan McCracken's book and the teacher of that course. And during the process of getting to know the teacher of that course, I got offered an assistantship to come back to work as a master's student which I did eventually do.

So I had this first course at UCLA Extension and I had that second course at San Diego State and eventually I entered their master's program.

14:30

B: When you were in college and high school you said there were very few females.

J: Yes, in math

B: In math. And they hired you as a female in programming. How about your cohort there? On the wind tunnel project.

J: There were three people who did computation and computer operations and data collection. Two of us were women; one of us was a man. The other woman was not a programmer. She had been taught how to operate equipment, how to manage equipment; how to collect the data on punch cards, how to put them in the right sequence, in the right order to get it run. She was the person who first taught me how to operate the IBM 650. But then she had never taken any programming training on the job so she didn't have to that part of the job. She used to say to me, "We brought you in so that we didn't have to rely on the old division over there to write all our programs. We got you to write our programs for us."

So we wound up with about 10 different kinds of computers. It was really amazing. Some of the really large computers were not in our building. Even the IBM 650 was not

in our building. We had get over to the other building and bump people off. The queue in those days was humans standing in line. There were no operating systems. So you had to sort of wait your turn to get on. And the minute they saw us coming they would say "Oh, no. Here they are again" because we had priority to bump everybody off. Because the wind tunnel was being held up while we were gone.

That's when we got the roller skates. You must have heard the story about the roller skates.

B: No I haven't heard the roller skate story.

J: Well, there was a time when Maggie and I were both on day shifts; the young man was on night shift at that time, and we had this real crisis project that was done for American Airlines. We had to prove that the plane, the one that was being tested could take off in less than a mile, and land in less than a mile. And we were going to get this huge contract if we could do that. And so they put us on sort of crisis mode and we had to go back over to the IBM 650 like 10 times a shift. They'd do a run and we'd charge over there; they held up while we got back; we'd take another run over, run back, take another run over, and so I hit upon the idea of bringing my roller skates to work. So I put my roller skates on and we skated over there through this big huge model design tunnel place and we hit the deck in the other building and they say "Oh, no, here they are again." But anyway we both found roller skates for a while. And so I call that "online realtime" with roller skates before online realtime was really possible.

So that kind of work, though, was exciting and fun because you really had to use all your imagination about how to gather the data. We had not only just some punch card equipment collecting data from the model as the wind was blowing down the tunnel, but we had little pressure points on the plane where tubes would be there and we had oil flowing through the tubes. We would have to photograph the manometer board they were called where we would see how high the pressure got pushed up in the oil and so we would then have to convert that to numbers and enter that in to our programs and build in calculations. I really needed a lot of help with what formulas to use for that because it was kind of beyond me on many occasions. So that is one of the reasons I chose to go back to school. I figured I could learn a lot more about the kinds of computations that are really needed for practical engineering programs.

18:29

B: So where did you … did you continue in the airline – in the wind tunnel aircraft industry?

J: Yeah, I was there full-time for three years and then there part-time after that. And there were as you may recall a lot of aerospace industries are up and then down and then up and then down. So there were a lot of cycles that occurred. So on a couple of occasions I was laid off. And it was funny because my boss, his name was Gene Dearing, would say "Well, it's time to get laid off again because if I don't I will have to lay off somebody with a family and you're going to school, so there you go again!" And so I'd come back on the breaks and come back on part-time jobs but it was interesting. I

maintained the connection with those people for so long. I still have friends from those days who live here in San Diego. A couple in other places, too.

But when I finally did stop totally with them and stay in school I had by that time met John, my husband to be. In a class, he was a mathematics major. He had been in the navy and he had gotten out of the navy and he had started to college and so I met him. Actually, I met him and then, in the course using Dan McCracken's book. And later it was so gratifying to me to eventually meet Dan McCracken and to get him to autograph my book from those days.

So then after I finished the master's degree I guess by then it was what, 1963, yes 1963. Then John and I had decided to get married. He had a child from his first marriage, John Jr. and he had sent him to Gettysburg, Pennsylvania, to live with John's parents. And so he wanted us to move to the East Coast just for a year, or two. Just for a year or two, until this child could be assimilated into our household. So we moved to the East Coast and John had gotten a job with Allied Signal. So we moved to Baltimore just temporarily.

B: Where do you live? {laughing}

J: I've been there ever since. It's funny because it was years and years later when John retired. I think he was 55. He retired and he said. "Ok, we can move back now." And I almost hit him. After all these years, and all these roots and all these, you know, "No you are not moving now."

B: Was there a gap in your resume when you moved back east? Did you continue directly in a career?

J: Actually it continued, because I knew that I was going to have a stepson coming to live with me so all the applications I sent ahead of time were all to industry. And so I had to sort of say, no, no, no I am not going to do that now. I want to get a job in teaching. I had been a TA at San Diego State. I really enjoyed it. I had developed some new courses for them. That was my first hand at developing classes. I developed the first FORTRAN programming course that San Diego State ever offered and I taught it. So, it was .. I even wrote the book and sold it at the bookstore because we felt that Dan McCracken's book was part of it but we needed more custom to our system. So when I got there, I went kind of shopping for which school might need someone. It is ironic that in 1963 I applied to Towson University which was then Towson State College. And they offered me a job teaching 5 sections of algebra. And I said, don't you have a computer? No, no, no, we don't have one of those things yet.

So the only place I found that had a computer was Goucher College, a women's college. And they didn't need anyone full-time, but they needed somebody to come and help manage the new machine that they had gotten through the NSF. So I took a job at Goucher College and I was called assistant director of the computer center, even though we didn't have a center yet. And I taught one course a semester a year and that was

statistics. The other thing that was really a shock was they didn't have any courses for credit, computer courses. And I said shouldn't you be teaching a computer programming class, a FORTRAN course for all your math majors? Oh, no, that's not a college subject. That's a skill and that's like a trade. And we'd love for you teach that, but you can teach that after school as a club activity. So they had this different mentality about what was academic and what was not.

It was years later, probably after I had left there. I was only there three years. I got a phone call from a friend at Goucher who said you should be interested today because we approved computer science as a major today and I know how hard you fought to even get a course acknowledged. But we also eliminated Latin as a major, too.

So I actually wound up three years at Goucher College in more or less an administrative position, and I left there on purpose because by then my stepson had been more or less assimilated into our home and I was getting called in all the time to run administrative work on the computer. And running administrative work on a punch card IBM 1620 system with a collator is not fun, and it takes a lot of time, and they would not allow me to hire any staff. The only workers we had were students. So if a student was supposed to get there and didn't get there, I would have to go in and run the work because it was needed the next day. So I finally said, I've got to leave. If you're not going to hire any staff, you're not going to set up a decent computer center, then I'm going to leave. So I waltzed myself down to the Baltimore Junior College, and said I'm here to see if you need a math teacher (they didn't have any computer courses, either.) It was then 1965-66. And so they said, well yes we do need a math teacher, but didn't you do computer work for Goucher? We're getting a new computer. Did you know that? We're getting a new computer. And it turns out it was an IBM 1620. And when I told them that is what I had been working on for all those years at Convair and then all those years at Goucher, they said oh my gosh, we don't know what to do with it, could you just start this week? So I wound up getting placed right away at Baltimore Junior College which became Community College of Baltimore.

B: Was that a teaching job or an administrative …

J: That was a full-time teaching job. And it was interesting that they had hired someone in business who in data processing because by then there were majors in the associate degree level in data processing. And he was hired and he knew all about unit record equipment, punch card readers, collators, sorters. He knew all about that kind of stuff and they didn't have anyone who knew programming. So they put the two of us together and we became kind of co-chairs in creating a new department at the community college. So it turns out so that as the unit record stuff was being phased out and we were phasing in a lot more programming we wound up with an associate of arts degree in computer science, which was kind of rare at the time.

B: But you didn't stay there forever.

J: No, I actually stayed there a little more than 15 years.

B: Did you go back to school during that time?

26:34

J: Yes, I started, even when I was at Goucher I started taking classes at Johns Hopkins University. They also did not have any computer courses but they had a doctorate in operations research which was very practical, very hands-on type engineering applications, so I took something like 16 credits of coursework there even while I was at Goucher. After I went to the community college, I stopped that for a while and then started shopping around for a place to transfer that work to continue work towards a doctorate.

I finally had a compromise solution at the University of Maryland, College Park. Because I didn't want just straight computer science after talking to some people about it at Delaware and College Park both. I wanted computer science with education and especially with educational administration, computer centers and facilities for universities. And that was kind of out of the element. They said you can go to business ed and teach typing or you can go to computer science math ed and teach calculation. But we don't have anything in between. It was really fortunate that Dick Austing was there and I had met him and a couple of other people came together, even Bill Atchison was on my committee. And they convinced the education people under educational administration that there should a way to do an interdisciplinary doctorate. So my doctoral program had additional courses some in math, some in business administration, and some in computer science but they were all geared toward the administration of college, university computer centers.

B: Who was your advisor?

28:37

J: My advisor was in the college of education and he was Robert Stephens. He was predominantly in education administration. Most of those people were going to become principals. I was an oddball in the whole process.

B: And you were teaching in the community college while…

J: I was already teaching at the community college and I had already by then become the department chair, which we called Computer Information Systems. We called our department Computer Information Systems because we had this combination of data processing and computer science both which is when I came together with the fact that you do not only the scientific work like the wind tunnel work, but the administrative work like the Goucher College payroll for example and scheduling. All of those are needed in this computer field so I really wanted to be at a place that would allow those to be. So when I was still working on my doctorate I had taken a year off to spend pretty much full time on my coursework and I did an internship for the state of Maryland which was a statistical study of what is called the Governor's Commission to Restructure Higher Education and I was assigned to work with one of the contractors to gather data

and to do projections and research projections on what were the needs in the higher education system in Maryland.

30:10

I did a lot of statistics and a lot of programming, and we used the Delphi technique mostly for projections, so it was a wonderful experience. Since I had already been teaching in the community colleges, I thought I didn't need those courses, but they made me take them anyway. I still hadn't finished my doctorate, and I taught one semester at College Park, so I had the experience of teaching a huge section, 150 students, with 5 TA's. After that semester, because I got so very little done on my own degree because I spent so much time teaching the TA's, then helping the students at other times, that handling that one course, it really taught me how difficult it is to teach large section courses with TAs. I swore that when I took any other job it was always going to be with reasonable size classes.

31:10

When I was supposed to go back to the community college, after my year off, I was presented with an offer from Towson State, it was still Towson State at the time, I was going to teach for them, and I thought, I'll do that temporarily, because there were certain situations that were going on at the community college that were very displeasing to those of us in our little new department. We were very upset at some things that had happened that were above us, at the next level up, and some things that had happened in my absence were very disturbing. It turns out that 5 of us went in and submitted our resignations to the Board of Trustees, all on the same day.

31:55

It was interesting, because they said "What are you going to do?" I said I don't have a job, but I have an offer from Towson State and can go and teach for them if I want to, but if I do it is definitely temporary because I don't want to be there permanently. As it turns out, and I have memories of that offer to teach 5 sections of math way back in the 60's and I thought, I got to see what they've got and sure enough their equipment and their programs and their initiatives were worse off than the local 5 or 6 community colleges. Their equipment was out of date, they were using an old state system that hadn't been updated in 10 years and so when I went there I thought, I'm never going to stay here.

32:40

They had some new people coming in at a level that had some influence so they started making changes, enough so that when they suggested forming a department, splitting for math, I was all for it. I was promoting that and pushing that and so I became the first department chair of the new department. So that's when I decided, I guess I'll stay.

33:01

They also allowed us to name our department, not just Computer Science, but Computer and Information Sciences, plural. So that we could bring in other kinds of programs relating. I guess I've always been promoting the breath of the field.

B: So you hadn't finished your PhD yet?

33:20

J: No

B: And you're the department chair of a new department.

J: That's right. In fact the new department, I went there in '81 temporarily and in '83 they decided we were going to have a separate department and I got named, but the department didn't exist officially until '84, and it was in the fall of '84 that I got my doctorate finished and graduated. So I got named department chair as an associate professor and then I got promoted after my doctorate to be full professor.

B: Well, this is a good time to go back into professional service because the computing community is certainly aware of many, many of your activities that have really helped the computing community and I know that they started way back before you went to Towson. Do you want to talk a little bit about the professional service and how you got so deeply involved?
34:17

J: Well you know, at San Diego State, when I was a grad student, I attended meetings of the ACM, and I joined as a student member, way back then. But I wasn't really active and I didn't do a lot, and then even in Baltimore, in the 60's, I went to the Fall Joint Computer Conference, almost every year, it was in Atlantic City most of the time. It was really invigorating and energizing in that so much was happening and you met people from all over the country. But it probably was the first occasion that I really got involved was the year we lived in Boston, when my husband was given a year, called the Government Mid-Management Career Program, by then he was with the Social Security Administration, which is why we didn't leave to go back to California.
35:17
It's because he took this grandiose job at the Social Security Administration headquarters, and so the year that he went for his Master's at Harvard, we lived in Boston, we lived actually in Cambridge. I attended the ACM conference that year and was very active in a lot of activities that went on that year. I became pretty much involved and found out they had an Education Board and they were doing curriculum work and stuff. Even in Boston I taught at Chamberlain Junior College, which is on the Commonwealth Park with something like 15 buildings in that area of Boston. I had to develop syllabi and course outlines and equipment needs and all that for every course that we were doing at the time. So I had really had gotten myself ingrained in course development and curriculum activity even at that time.
36:18
It was in 1972 that I went to the Fall Joint Computer Conference. One of the reasons that I remember that date is that it was just about 8 weeks, 7 or 8 weeks after my son was born. Rob was born in March of 1972 and we had come back from Boston in '68, '69, and early '70, and then I had gone back to teaching at the community college. There were meetings there about curriculum and that's where I met two very influential people in my life, Dick Austing, this was in 1972, long before I had ever talked to him down in College Park, which was later on, and Jerry Engle, I had met them at one of the book receptions.

We wound up sitting and talking almost all the evening, just on and on and on. It was so kind of invigorating about what they were doing at the different places where they had been and where they were.

They said they were active in the ACM SIGCSE. I had been, I think for the first time, I went to one of the first meetings in the late 70's and it was 5 years after, I think it was probably 1978 that I was invited to one of the Ed Board activities. I realized after listening, watching, and hearing, that number one, they were promoting Computer Science, but nothing broader, and number two is that they were being very exclusive in that they were not necessarily considering programs except for 4-year and higher, 4 year Master's and Doctorates.
38:13
And so I wound up speaking up a few times about it. But you know there's a lot of other people doing things in this field and actually the community colleges were among the first to ever offer courses. They offered workplace type courses. So I went to meetings there and later on worked on some of the SIGCSE activities and eventually got so outspoken, I guess, that SIGCSE offered us (at the time Dick Austing was the chair, I think) at the next conference that they were going to hold if we really were serious about doing something at the community college level, that they would provide support money to get our group started. So I think it was at the 1974 or 1975 that we started the community college committee of the Education Board and by 1978 we had published three curriculum reports, which is apparently the first time that any association had published curriculum reports for 2-year college associates degree.

B: I am getting a little bit foggy on the timeline. Were you still with the community college at the point or were you in the graduate program?

J: I left the community, let me think now. I was at the community college from 1965 until 1981.

B: So you were there during this time. So during this report time you were there.

J: So I was at the community college at the time I was speaking up. And then later, I think it was probably '82, '83, '84, it was after I had left the community college, I still remained on that committee for a while. I was the chair of it for about 6 years. I'll have to check the date on that.

B: It's the flavor we're after, not the ...

J: Not the exact times. I sort of promoted and pushed and eventually the ACM Education Board set up a community college committee which still exists today and I'm proud to say. Some of the same people we had initially worked with remain leaders and we have lots of new blood come in. That's been something I am really, really proud of is to break into that mode so they are more recognized. In fact there were some reports that came out at about that time. The Manpower Commission (it's now called the

Commission on Professions in Science and Technology CPST) but it was the Manpower Commission before the Washington Area helping organization.

41:15

They came out with reports that the whole workforce studies had always ignored –the two-year college graduates—what they could do and where they were. I had spent a little time working with Betty Vetter. And we got some of those quotes and some of that evidence to show ACM, in order to show that this area was not necessarily being recognized. And it turns out that not only did ACM recognize them, but so did NSF. Because now community college people would get invited to be panelists, to review proposals, to recommend, and now even the federal government collects two-year college graduate data. So I think about the same time I was pushing it within ACM, other people were pushing it in other places. It got eventually very well recognized.

B: You were very active at that time. You had a young son and you were juggling a lot. Finishing up a degree. How did you juggle it all? How did you do it all?

42:15

J: Well, you know I had a very supportive family, especially my husband. He was very supportive. I am sure there were times that he wished I weren't so involved, but we were in Baltimore and I didn't have any family there. I didn't have built in babysitters; I didn't have family to help take charge, to tend to things. I even went on trips; I went to SIGCSE meetings. Yet I had developed this wonderful rapport with a bunch of folks that were so helpful. One of my neighbors had 12 children. And so it's funny because I had sort of cultivated her friendship long before Rob was born. Rob was kind of a surprise because we had been married quite a number of years by then and our stepson had grown up to be now about 14-15 years old. He moved in with us when he was 6. We had gotten married when he was 7. As a result we thought this wasn't going to happen. But it turns out he was a wonderful surprise. I knew all my neighbors; I knew the family; I had a very active church life by then. The woman who was the church nursery caretaker became Rob's personal babysitter. The woman who had been my housekeeper became one of Rob's babysitters. Several of my neighbors had been taking in children for daycare. So I used them some. Of course the neighbor with 12 children gave me one. Two years later gave me the next one; two years later gave me the next one. I had all kinds of supportive help in doing things around the house. My husband really had always been the type to take over a lot of the responsibilities. It was really a lot of help. I had a lot of help.

44:19

B: What was your attitude toward research -- the kind of research you did was very practical (is that what I am hearing you say?) through your academic career?

J: Very. In fact I really did not want to be at a research one university. I did not want to be in a total research setting because I really loved engineering and even though I did not go to an engineering school, my work in operations research at Hopkins was very practical use of math, and use of computing to optimize how you can do things efficient ways to do things. I loved the application of math to do that kind of thing. I guess because of my curriculum activities I got very interested in how do students who go to

programs let the workplace know what they can do? Because we didn't have any real easy way and most people in industry who were doing hiring didn't know the difference between computer science and other degree programs that were evolving. Someone could go to high school and study this and someone would go to practical trade school.

How to have industry know what a student could do, what capabilities were, was of great interest to me. I kind of got involved in evaluating and looking at certification exams and what kind of things they could do. At one particular ACM meeting, Fred Harris was giving a talk on the creation of the ICCP and he said that they were going to end this registered programmer exam which I had been having my students take because they could show that to the employer and say that not only did they have this degree but now I have this certificate thing. I got up and made some choice comments about how you are not helping the industry unless you give students ways to show what they can do, and the changes they were making I didn't thing were so impressive. So as a result of speaking up at that meeting I kind of got invited to some meetings that the Institute for Certification was holding. Apparently, the institute had been formed in 1973 and had taken over the certification exams of the DPMA. One of my first kinds of research was "What good are they?" What are the good things about certification and do you have a viable career path?

It turns out that my doctoral dissertation research was a follow up study of graduates of two-year colleges and their career paths 10, 15 years later. I had been so proud because I had developed actually a mathematical model of career pathing. My education advisor said we don't need that. You need to find out if they are happy. I wound up doing a lot of things, and questioning, social research and personal things, a lot of things that were kind of unrelated to my mathematical model that I wanted to use. A lot of that was finding out that the kinds of research that people are interested in was varying at different places. I then began to study workforce trends.

47:58

I did a study on gender and workforce trends way long ago. I did a study on certification by the states of their teachers. I did another study on demographics like where are they. This was an early diversity thing. This followed up on my dissertation. In fact, I discovered that most are men and most are white and most are WASP -- white Anglo Saxon Protestants. The next was way down and it was Asian. And there were no blacks, no minorities. That was one of the other things that I carried with me to the community college, that some of this needs to be promoting. As the community college where I was teaching became more interested in attracting minorities, we were certainly there to try to lure them, get them involved. It was interesting, though, that in several of the studies I did, it was the minorities who didn't want to return their survey forms. In spite of the fact a few of them were going into the field they didn't want to be involved. So you think that well there is something else going on here that we need to be interested in. A lot of those really never came to too much. I actually probably wrote more about curriculum than I did about anything else. Then, let me think. What was the other??

49:00

I got very interested in the promoting of software engineering because of government jobs. Government jobs for a time, after a huge workforce study had been done on the

federal government workers, and knowing because my husband was with the federal government as a worker, and I knew a lot of people in the Baltimore Washington area who were working for the federal government. They did a study and as a result recommended the creation of some institute that would promote education for government workers and would give government a way to determine what are the good practices to be able to be used in software development. That of course became the Software Engineering Institute. That became SEI. So I kind of followed the work that led up to the creation of SEI and also followed a lot of work that they did and began to attend a lot of the software engineering activities.

50:30

B: During the interview you mentioned some names, an almost symbiotic relationship between you and the people that you were professionally involved with. I normally would ask the mentoring question – who were your mentors? But it almost sounds like listening to you that it is a co-mentoring process. Do you want to talk about mentoring, professional mentoring and the future?

J: That is an interesting question because I am so strongly convinced that mentoring is an important, mentoring is useful, mentoring is very helpful and that we need more role models of people to do mentoring. But I have never been really active myself, or considering myself doing it. Or even in using it. It turns out that in most of my situations it has been almost a collaborative endeavor, not necessarily a mentoring endeavor. There have been several colleagues who I have worked with who helped me a lot and then I helped them a lot, but they were in different kinds of things. I don't have any specific people to mention unless of course you mention some people like the ACM folks – Dick Austing for example. He really became a mentor to so many people and was encouraging. I think that even though you don't really consider those people mentors, you consider them influential. They gave influential encouragement at time when it was very important.

52:14

At one point in my life I almost stopped my work in completing the doctorate. And it was Dick that got me. He said that's not a problem. I've got this incomplete in this one course and this professor is leaving the university. Because of the politics they were rearranging the way courses were in Maryland. That whole department was being shifted and he was leaving. I wound up being told that he couldn't finish this project I was working on. I was just beside myself. It was like the last official credit course I needed. It was at the time too when my son was little. I was really busy and I was working and I was commuting to College Park one day a week and a half day a week another week and just the commute itself was tiring. I was beginning to think was this really worth it. Especially because I was older finishing it. He said. "Of course, it's worth it." He said "You leave that incomplete stay on your transcript the rest of your life. You don't need it. Pick up another project. Do something different."

He helped me find another project that turned out to be enlightening, interesting, exciting. It was a study of hospitals implementing one of the Medicare laws. He sent me like a

100 page document to read about it and said that's not enough. We'll just have you sent over there. I learned so much about requirements analysis in that particular task because being there and watching how things had to happen was a real learning experience and I went away knowing, okay, now I know what we've got to do. It was a multiple hospital setting, too, which needed a satellite transmission, so it turns out I had to get into that. Costs of satellite transmission, what times are they passing over, when can you transfer your data. It turns out to have been a wonderful experience. It wound up that … so in that sense I guess it's not a mentor but certainly an influential advisor. I've had several people like that that were helpful and supportive.

B: Now you are toward the end of you career and you are a very senior person at the university. What gives you the most joy at the job and in the profession looking back? Right now. Where you are now. What has made your joys?

54:56

J: Right now I am very gratified, I guess is the right word, gratified to think that that at several points in my career there have been something that I recognized that needed to be done, and by speaking up and by getting some others to speak up, we were able to accomplish something like the community college movement. And there were other things like that – the information systems movement. They were also not accepted within ACM, or Education Board. They were not been recognized as one of the disciplines. A couple of people who spoke up and I certainly jumped on that bandwagon to support it after my management at Goucher College and running the computer system to do practical work. I think those trends in the field and the changes that occur at certain points in time. It's interesting to look back at the history and see when did that happen and be opened up to that. Especially now as a profession we are promoting breadth in so many ways. NSF has a program they call Broadening Participation which predominately they intended to be broadening of the demographics, bringing in minorities and women, but broadening to realize that computing is everywhere and is needed in almost all the disciplines is another part of broadening that I think is really is important and I guess I have kind of been pushing that, too, for a long time.

56:25

B: And I do want to say because we don't have video going on that your eyes just began to sparkle. You weren't looking back, you were looking ahead and looking at that next challenge.

J: So there are several things that I have been proud of. I was really also very gratified and been totally disappointed at the workforce studies that have been done on academia. Of course a lot of those movements have succeeded. I was actually in the 60's and early 70's, I was on an accreditation committee of ACM that resulted in accreditation standards for private institutes teaching computing courses, not degree, but they were called degree mills because they were private, and student paid a lot of money and went in for training and then were not sure what they learned. So I worked with some very prestigious people on that early committee. Then later it turns out that accreditation picked up steam again later on; I was not involved in that second wave, but

I was certainly supportive of it. I was really pleased to see that accreditation movement to accredit computer science programs take off and that seems to have sort of slowed down, even though now they have begun to accredit information systems programs. The thing that I have really found gratifying even though I didn't work on it, was when the education board finally came out with five reports. One of the side things that I was really pleased about is that in our early two-year college work, we had one report of those five we did that was called computing across the disciplines. It is now called Computing Across the Curriculum. Even now the all of the reports have got some components like this program like software engineering can be used across the disciplines or how information systems can be used across the disciplines and so on. So that whole movement of bringing it across the disciplines is the kind of breadth that I am pleased about, glad to see happen.

58:45

B: I am going to go from breadth down to narrow. The narrow is – can you tell me something about your teaching philosophy? You have been in the classroom a lot over a long period of time. How has you teaching style changed, do you have a philosophy? The one thing I heard you say was that you didn't want another one of those one hundred and fifty student classes with five TAs to manage. But what kinds of things can you tell us about you ideas about teaching and how they have changed or matured?

J: Probably one of the major influences on my teaching was the fact that my first experiences in learning of this field were on the job, were training programs on the job, or self-study on the job. I really believe in learning by doing, learning by practice, learning by doing. So I try to being into the classroom, under the constraints that we have in the classroom practical experiences. I have always tried to bring in graduates of the program and let them tell about their experiences. I have always included stories, the story of what happened and what was the moving point that brought that to bear. When the movement came, teaching and learning movement, several folks in higher education promoting the teaching and learning movement which is more of a constructivist philosophy, that students learn, retain more about what they've learned if they themselves have processed it through their own brain rather than just surface knowledge or listening to somebody or reading about it, that they actually have to do something with it. I've always tried to have in class in class activities that students can participate in. I encourage lots of discussion, I sometimes have small group discussion; three people talk about this question. It is especially easy to do that in courses of societal and ethical issues, societal and ethical concerns. It seems that in those kinds of courses that's not only easier to do, but it seems that most computer science majors don't know much about it to start with so there's a lot to learn.

1:01

In regular programming classes which I haven't really been teaching for a while, it seems like as you move forward in your field you are able to pick and choose more like what you'd like to do and I've sort of co-developed, (it was first with Doris Lidtke before she left), we developed the first courses we had in what we called computer ethics but they were societal and ethical concerns for computer scientists. In those courses, we

didn't really expect to be so successful or take off. We thought we'd run out of material and it turns out they have just really done well, succeeded very well, and students really tend to enjoy them a lot, they say.

Of course when accreditation bodies, ABET and CSAB, when they said you must include that kind of thing in accredited programs it kind of gave that a stamp of approval. So we use a lot of in class exercises in those classes like debates, you've got to argue your way through a point. And even in my other classes, I have been teaching several gen. ed classes recently and I also teach the undergraduate elective in software engineering which is of course one of my favorites. People come in thinking oh, this is just another programming class, but no, it is not. It is not another programming class. It is about programming but it is not to teach more in computer programming. We are using process models from the Software Engineering Institute; we teach process models; we teach estimation, we teach how to better manage a project, what to look for; how to know about; how to manage it. What are all the design alternatives that are there, and what are the different modeling methods you can do it with. The students instead of writing a program will maybe have to write a test plan for a system or something related to that. That has really been a joy. Apparently it has been very well received locally although there is no particular standard for that anywhere, not even in the new software engineering curriculum, which would start the software engineering curriculum model that the ACM developed starts off doing that early on, so it's a totally different approach. But for computer science majors who have never had any of that, doing that kind of thing is what I would like to think of as a capstone. Having them handle some of it and do some of it has been really gratifying in that they come back from job interviews saying "Gee I'm glad I knew what CMM stands for!" That has been one of the things I enjoy the most.

1:04

The most recent thing I have been working on is using computer history in advanced composition. We have a general education movement called writing across the curriculum, lots of schools have it, and I started developing this a few years ago and then got interrupted by a leave of absence and so on, but now I am finishing it up. We developed an outline and experiences and some support letters for creating a new advanced composition course which is called Second Writing. Many institutions only require freshman writing, but if an institution is a member of the writing across the curriculum consortium, you have to teach advanced composition which is writing in your major. We currently don't have writing in our major so student wind up taking business writing or history of science over in physics or something, but this would be a history of computing and information technology and it would involve a study of our discipline and writing about our discipline. That is one of the newest exciting things I hope to get accomplished before I retire.

1:05:19

B: As we are sort of winding down here, do you have any strong outside interests outside of computing that would make us see who you are better?

J: Yes, I have had lots of interests over the years, but it turns out that a great many of them are classified as literature. I read all the time. I have always had a love for science fiction even though it was not popular when I came up. I have been trying to use movies and science fiction film clips in classes to show points of what might happen in privacy if we aren't careful. I really have become a real aficionado I guess of film, film festivals. I joined AFI. They have a theater in Silver Spring, Maryland, and they often show classics; they often show documentaries and so on. So that is one of my causes. The other one is tennis; I am just wild about tennis. I've always played tennis since college.

B: Well, you couldn't play there for a while. So clearly you got back. I was wondering about the roller skates. They must have let you start physical activity again.

J: Yes, they did. In fact, I started doing physical activity again and even playing tennis again, not right away but after a couple of years after that illness. I even played on a women's basketball team for Convair. That was three years after my illness. And you know everyone had said you have to be so careful.

1:07
You don't want to have another breakdown or have that recur, which always can happen with tuberculosis but I've been fortunate that I have been very healthy. My women's basketball team at Convair, we had some wonderful times. We never entered competitions to try to win a tournament against schools but we were constantly playing what you call exhibits. We played the Navy one time, the Navy men; we played the Marines was the one I recall so much. We played the Marines. Convair women's basketball team played the Marines enough that we got our picture in the paper.

B: Wasn't women's basketball in those days three-three?

J: When I played in college it was three-three. When I went to Convair it was playing men's rules – five on a court all the way up and down.

1:08
But when I was playing in high school it was three-three. And you only played half court. And then even when I went to college it was three-three. I forget what year it changed frankly.

B: I played three-three, but I don't know what year.

J: You played three-three. Then you know. But it turns out that my women's basketball career in college at Northeast Louisiana State was that we were written up in the campus newspaper as the team that is all ready but never gets to go anywhere because many of the schools in Mississippi, the colleges in Mississippi, had women's basketball teams that traveled everywhere. Our women's basketball team played mostly intramural games and demonstration games to make money for causes and we would occasionally

get to travel to another place because men's basketball team was traveling and we could go with them. But we didn't really have a competition in college like you would normally today expect. That was before title IX.

B: So tennis became "The Sport."

J: Yes, I still, and in fact I discovered several friends in SIGCSE who like tennis and we used to sneak away and go play one tennis afternoon in SIGCSE. And also the NECC conference, the National Educational Computing Conference, I attended for quite a long time. There were groups there that would sneak away and go play tennis.

B: Big dark secret. Sneaks away to play tennis.

J: Sneaks away to play tennis. In fact now a bunch of us meet up at the US Open on Labor Day weekend – several of us, sometimes as many a six women who meet up there to enjoy the US Open tennis.

B: If you had advice at this point to give a young woman starting out in computing what would it be?

J: Don't let people hold you back. You know, don't be shy. You know I was very shy and I was not necessarily going to speak up until I got angry. And I waited a lot longer that I should have in many cases to speak up or to say something or to present my opinion. I think that they should just move on and when they have opinions or attitudes or expressions they should express them and find others with common interests and common causes to work with because there's just a lot of wonderful people out there who need colleagues to work with and so try to find them.

1:10

B: This is a totally different kind of question. If you could change one decision that you made along your career path, could you think what that might be?

J: {long pause} No, I never thought about that before. Probably though, looking back … You see a lot of times when things happen to you, you don't think of it as a blessing until years later. You discover you thought it was terrible but looking back, that illness I had in college was really a blessing. You look back and think -- but for that illness, I would have remained a phys ed. Major, been a basketball coach in high school and married the boy, guy who was the star of our campus basketball team who I dated for years. But because of that illness I really had a total turn around in my life. I think sometimes you have to (well the way we expressed it then, you have to fight while your lying flat on your back). And you don't realize that in performing that fight you are actually thinking through situations and that you make turns in your life that you would not have made otherwise. So looking back, I think the only thing I didn't do soon enough, I didn't start the doctorate soon enough. I waited a lot longer; I just had so many other interesting things to do with my life that I didn't start that right away. And I remember when I got married John said, "Are you done going to school, now?" [laughs]

I guess I probably would have started it sooner even though it was so difficult to find what I wanted because I was ahead of my time a bit. So I didn't find a program like I really wanted; so I had to design it. Now young women can find more that is available to them now, so I would say that they should be more aggressive and move quicker to check out some of these options for themselves.

1:13

B: The final question. If there's one story (and you've already told the roller skates) that you would like to be sure got in the record, that you want to be remembered for, that you just chuckle about something that happened in the classroom, any one story that "Oh, yea that's a Joyce story."

J: That's a hard question. What one story – like the Grace Murray Hopper and the bug, the moth she collected. What one story? I don't know that I have any except the roller skating story.

B: Well, we'll take that one – real time computing.

J: Yea, real time computing before it was real time. Gee I don't know of another.

B: I think we can take that one.

J: It's funny. Some of the biggest influences in my life have been non-professional, so I can think of some stories there.

B: You can tell me a non-professional one because that was one of the questions. What things keep you ticking outside the football story that isn't on the record?

J: The football story of the dinner I prepared. There was another dinner that I prepared that was also way up there in the competition which my son and my step-son got into a big debate and wound up ruining Christmas one year. It was just unbelievable.

B: Do you remember the topic of the debate?

J: Yeah, yeah. The topic of the debate was the two boys began to compare and one boy criticized the other about what they were or were not doing for their parents. So it involved us, which was worse that they got into this argument. They didn't speak for a year after that. And they both left and one got to the airport and flew back to Texas. You know, and it took a long time for that to be resolved. That was awful. It ruined that Christmas dinner that I had cooked already.

1:16

The other experience that has definitely changed my life is living in hospice for four months with my son who was dying of melanoma and yet he was feeling good except that he was paralyzed. He was mentally alert and capable. It really ... it is actually the first time that I actually dropped everything and left. It has changed me a lot, and probably

for the better. It has in fact brought out the strong need for high touch to be combined with high tech.

B: I must say that Joyce is very emotionally moved right now. She is in tears, but she is very peaceful about this. It is a lovely way to end this and say thank you for your time. You are a beautiful person and I am glad that you gave me the time. Thank you.

J: Thank you, Thank you. It means a lot to me.