

**Excerpts from the Computer Science Department - State of California Franchise Tax Board
Outcomes Assessment Meeting held in Sacramento, California May 17, 2005**

Organizers: Cici Mattiuzzi, ECS Career Programs Coordinator and Sally Bennett, Franchise Tax Board IT Recruitment Coordinator/Data Processing Manager II.

Computer Science Faculty Attendees: Chair Du Zhang, Bob Buckley, Bolan Jiang, Mei Lu, Anne-Louise Radimsky, Ahmed Salem, and Cui Zhang

FTB Attendees/Computer Science Alumni:

JK, Systems Software Specialist II (currently enrolled in MS program)

NS, Senior Information Systems Analyst (BS 1999)

FF, Staff Programmer Analyst Specialist (data unavailable)

BA, Staff Programmer Analyst (BS 1984)

CW, Senior Programmer Analyst (MS 1999)

NK, Data Processing Manager II (MS 1985)

VD, Staff Programmer Analyst/Applications Developer (BS 2001)

BM, Associate Programmer Analyst (BS 2004)

QUESTION 1: WHAT CSUS LEARNING EXPERIENCES WERE MOST VALUABLE TO YOU IN YOUR CAREER?

BA: “There was a variety of areas, but Senior Project was a ‘biggie.’ I could relate what I was learning to my work.”

BM: “132, 136, and Senior Project. Also the courses in which I got to apply what I learned, like 133 and 137. I use a lot of Microsoft products like Dot.Net.”

FF: “Cobal was valuable. There is so much Cobal at State agencies and it is the one thing I have used the most. Also Senior Project. Working together was very beneficial because here you work as a team.”

Anne-Louise Radimsky: “Have you had to learn other languages like Java and C++?”

FF: “No, not those – I’ve used ‘Natural’.”

NS: “132 and 179. And yes, I’ve been able to jump to different languages.”

CW: “239, classes from Drs. McNamee and Radimsky, 137, classes on hardware and how to figure out how to make something work – how to apply theory to product. Pascal, Assembly, and programming languages.”

VD: “137 because now I understand how instructions are executed. Today there are multi-core processors. Also caches, virtual memory, how CPUs work. 139, operating systems concepts. You really have to know all that in order to be a really good developer. Multi-threaded programming. I now know how difficult it is to relate to threads. Database courses – relational databases are still relevant, still big. OO [object-oriented] databases have never really taken off. 175 – networking has been very crucial to me as a developer because networks are all over the place. What makes networking possible.”

JR: “Theory classes – data structures, compilers, etc. When I’m writing programs and I get a compiler error, I have an idea of what’s gone wrong. Also the research methodology class.”

NK: “Problem solving skills and logical thinking. My undergrad major was literature, so I made a paradigm shift [in doing my MS]. It was a different type of thinking. I have worked in different programs but the way to think is always the same.”

QUESTION #2: WHAT KNOWLEDGE AND SKILLS THAT YOU ACQUIRED DURING YOUR EDUCATION HAVE YOU USED MOST?

JR: “Team project work. You rarely work by yourself at FTB; it’s usually in a team. Senior Project taught me how to break up a larger project into smaller tasks and schedule workers for what to do and when they have to get done.”

VD: “Analytical skills. Also how to break a big project into smaller, more manageable bits. Data structures, programming skills, relational databases. How to write efficient, maintainable code. Working in a team. Technical writing skills. How to write up documentation for review. How to analyze performance issues, bottlenecks. I might even analyze actual algorithms.”

CW: “Programming – Pascal and 130 really built a foundation. Learning how to learn.”

NS: I used fundamental things early on. Now I’m overseeing technical development and I get called in over problems. I do tons of analyzing performance issues. Troubleshooting skills. Team building is very important... I’ve developed a reputation and people ask my opinion. I have to write issue papers for the Internet, such as why we should spend \$250,000 for some product. I got writing skills mostly from Senior Project. I still refer to things I learned then, things that came directly from Senior Project. Networking stuff so that I can understand what system administrators are talking about in meetings. Testing – how readable products are, security, performance, GUI testing, and system testing.”

FF: “Fundamentals and Senior Project.”

BM: I’m mainly a programmer with four other Dot.Net programmers. I’ve had to flesh out requirements, and I learned how to do that from Senior Project. I do web applications. ...Also I wanted to say that I’ve been able to quickly apply what I learned as a base to other languages.”

BA: “Cobol, data structures. I work on legacy systems in Cobol and Natural. Half of the systems are in Cobol. I can’t beat Cobol for speed and maintainability.”

Sally Bennett: “They get different projects in different languages. FTB is constantly updating and staff are always learning new languages. We have had no problems with employees learning new languages...”

Bob Buckley: “You mentioned maintainability of code. How do you ensure that?”

NS: “We have a very tight window of when we can maintain our systems. Whenever we can isolate different places into one module so that we can then use them throughout the system, we do. We try to architect the systems so that they are database-driven.”

Bob Buckley: “What about code review?”

NS: “Yes. There’s a whole formal process for that.”

VD: “We also do formal code reviews and testing.”

FF: “We have coding standards and standard modules to enhance maintainability.”

NK: “Also, good documentation.”

Sally Bennett: “Our major systems are very well-documented.”

QUESTION #3. WHAT KNOWLEDGE DO YOU USE THE LEAST?

VD: “Our group doesn’t use Calculus at all.”

NW: “Calculus.”

BA: “Calculus, 137 stuff.”

Du Zhang: “But Calculus is used to develop analytical skills. What about Discrete Math?”

All agreed that Discrete Math was very important.

CW: “Artificial intelligence – it was an interesting concept but I don’t use it.”

JR: “Human-computer interface design. They could apply it in another section, but I don’t use it in mine.”

BM: “Nothing from assembly class. I do use Math except for statistics.”

NS: “Assembly language until with Dot.Net they have a reverse compiler which shows machine code and it’s like assembly language.”

QUESTION #4. WHAT DO YOU WISH YOU HAD LEARNED IN SCHOOL BUT DID NOT?

VD: “OO [object-oriented] design patterns.”

CW: “Software development – as a developer you have to be able to do everything, including getting requirements and documenting them. If you don’t define your requirements right, the system won’t work. I may have had it in class, but I didn’t learn it in school.”

BM: “I’ve talked to some other programmers in other organizations and none of us learned how to integrate databases with business software.”

FF: “Oral communication skills, giving status reports and presentations. I was a project administrator working with technical people and it was hard to communicate with them.”

BA: “Technical writing.”

VD: “Presentation skills. We didn’t get much of them. Some people here are very good technically but not comfortable giving presentations.”

Anne-Louise Radimsky: “Since we are at the point where we really can’t add anything to our program without taking something away, what do you suggest we give up in order to include it?”

VD: “Maybe you could have students give one presentation per course.”

NS: “Writing to request funding for something or explaining a technical problem in a business language.”

JR: “In one class I had to write IEEE specs for software requirements – that was good.”

QUESTION #5. WHAT ARE THE EMERGING AND EXPANDING FIELDS IN COMPUTER SCIENCE?

VD: “Data warehousing is very hot these days.”

Sally Bennett: “Data warehousing, data mining.”

BM: “Web design, XML, web services.”

BA: “Security – that is huge here.”

CW: “Client-server systems [software architecture], voice browser, speech recognition.”

NW: “Business intelligence – eliminating data redundancy, consolidating data systems.”

Bob Buckley: “What about mobile communications?”

Sally Bennett: “Our information is too sensitive for that. We are looking at the “millennium generation,” for example. Text messaging – we’re not doing anything with it right now, but we’re looking at it for the future.”

Du Zhang: “What about converting knowledge/expertise into knowledge bases?”

Sally Bennett: “Some of the systems already have that built in. However, we do not have any interfacing at this time.”

QUESTION #6. WHAT CRITICAL SKILLS AND KNOWLEDGE WILL COMPUTER SCIENTISTS NEED FOR THE FUTURE?

VD: “Adaptation. The technology and business landscape is constantly changing. You might be doing all kinds of different things, especially with outsourcing.”

NS: “Patterns and practices, design, OOP [object-oriented programming].”

VD: “The ability to evaluate different technologies.”

JR: “Methodology evaluation.”

BA: “Data architecture, security architecture.”

BM: “Efficient, readable, maintainable code.”

Bob Buckley: “Security and maintainable code are pretty much opposites.”

[General agreement.]

JR: “How to maintain code. In an academic environment you code, hand it in and never see it again.”

QUESTION #7. FOR MANAGERS: WHAT ARE THE STRENGTHS AND WEAKNESSES OF OUR GRADUATES IN THE CS PROGRAM?

Sally Bennett: “I’ve worked for FTB for 29 years, mostly in the IT field. One thing is very, very obvious – there is a part of computer science that they learn and bring to the workplace that other people who take courses piecemeal do not have.” She noted that although they hire from other universities also, CSUS is their number one school because our grads do better on their tests.

Minutes by Sara Joslin