Call for an Annual Survey of Software Engineering Education

A recent article about increasing enrollments in computer science programs [1] led me to wonder whether there has been a similar trend in software engineering. Unfortunately it is hard to find statistics about software engineering programs. The US Department of Education (DoE) publishes some data [2], but it only includes numbers of graduates, and the DoE is a little slow in reporting its data -- usually with a two year lag. Nevertheless, what they report shows an interesting upward trend (see figure below).

But seeing that data piqued my curiosity even more. How many software engineering programs does this data represent? My own survey [3] of 21 of the 50-or-so masters programs in existence in the US in 2003-2005 yielded about 700 graduates each year from those 21 schools alone. Maybe some of the programs I surveyed are not included in the DoE data. Is the number of programs growing at the same rate as graduates (either by joining the reporting effort or through new program creation), or are some programs becoming more productive? Have faculty sizes also grown, or are we becoming more efficient? Until the DoE starts to keep track of some of these other quantities we will need to collect them ourselves. Maybe we need to conduct an annual survey.

The Taulbee Survey [4], published annually by the Computing Research Association, provides lots of good data on Ph.D.-granting departments of computer science, computer engineering and information programs in the United States and Canada. The response rate of over 70% is quite good.

The Taulbee Survey reports data on Ph.D. degree production, enrollments and employment; master's and bachelor's degree production and enrollments; faculty demographics; research expenditures and graduate student support; and faculty salaries. Enrollment data is particularly helpful when looking for new trends, as graduation rates lag behind new enrollments by several years.

Here are some of the data items reported on undergraduate students in the Taulbee Survey: gender, ethnicity, bachelor's degree recipients, new undergraduate students, and bachelor's degree program total enrollment. Each of these statistics is broken down by department type (computer science, computer engineering or information) and ranking groups (based on the 1995 NRC rankings). The Taulbee Survey also reports statistics about faculty: gender, ethnicity, faculty size (number of faculty per department), new hires, and vacancies. Each of these is broken down by department type and position (tenure-track, teaching, research, post-doctoral), and some of them are also broken down by faculty rank (full professor, associate professor, assistant professor).

By studying the annual Taulbee Surveys we can track trends in enrollment and faculty load. This can be very helpful to faculty and administrators when planning and allocating resources. It can also help us benchmark ourselves against national and regional trends.

While the Taulbee Survey is a great source of information about Ph.D.-granting departments (PGDs), far more students are enrolled in computing programs at schools that do not offer Ph.D.s (NPGDs). Recently the Taulbee Survey for the Rest of Us...
(TaurUs) Project [5] was started to capture the state of computer science education at NPGDs. Efforts are underway to make this an annual survey.

We need a similar survey for software engineering programs. In addition to the types of data reported by the Taulbee Survey we could collect information about student work experience, internships and co-ops. We could also collect information about full-time versus part-time enrollments and percentage participation in distance or online programs. There are probably several other characteristics of our programs and our students that we should be collecting and sharing each year.

Currently there are about 40 undergraduate software engineering programs, and about 64 graduate software engineering programs in the United States alone [6]. The number of programs seems to be growing steadily, and enrollments and graduates are too. We need to start keeping track of these trends and making appropriate plans.

If you are interested in participating in or supporting an annual software engineering survey please send email to mark.ardis@stevens.edu

References:
1. E.S. Roberts, Meeting the Challenges of Rising Enrollments, ACM Inroads 2(3), September 2011, 4-6.