Can Statisticians be Effective in Educating Others in Statistical Thinking?

Bill Parr
University of Tennessee
wparr@utk.edu

The question

	Can be effective?	Can't be effective.
Are effective	Good news! We're already there!	IMPOSSIBLE!
Are not effective	We need competence, commitment. (Or something external)	Possible, and NOT GOOD NEWS!

How has the work content of statisticians changed recently?

- Prior to 1985 (or some similar date) --- big focus on “consulting” – solving problems and improving processes, with the statistician “doing the statistical thinking”
- After 1985 (or some similar date) – increase in emphasis on training and developing the ability of others to engage in statistical thinking

Resistance to this change?

- Statisticians who would rather get to exercise their craft of analysis, ….
- Non-statisticians who want to “learn the craft” more quickly, with less pain and effort, …
  - Shortening of BB programs
  - Weakening of the mentoring content

Can we be effective

- Do we have the tools to get the job done?
  - Knowledge and competence with technical statistical tools
  - Knowledge and competence to teach these technical statistical tools
  - Knowledge and competence with other tools required for statistical thinking to be effective

Approaches to the education piece

- “Come take a course from us at the school”
- “Take a short course from us . . .”

Where in such an approach is the ability to do “statistical thinking” cultivated?

Alternative model(s)

- Multi-week “short courses” with project mentoring
- Six Sigma training (special case of above)

What is different?

What sort of educational experiences are more effective in transforming practice?

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- Physical simulation
- Actually carrying out the practice

Practicing…

- If we have to practice thinking in a new way, is it likely to suffice to have someone, however qualified they may be, lecture at the student about that new way?

- What would the qualifications need to be for someone who could help someone learn to engage in “statistical thinking?”

Carrying along some thoughts

- Students probably need what Richard Sanders called “repeated dipping” – such as is supported by curriculum of multiple non-consecutive weeks.

- Students probably need to be MENTORED, not merely lectured at. Case studies won’t substitute for mentoring, in my judgment.

What makes Six Sigma work?

- Vertical plus the horizontal
  - “Vertical” = the process improvement engine (DMAIC or whatever model)
  - “Horizontal” = system for choosing projects and participants, developing and mentoring, following up and rewarding, and improving

Now, let's take a few steps back…

- What percent of those who pioneered "Six Sigma" (under that name) were statisticians?
  - Shades of Taguchi…
- Where do most books by statisticians on Six Sigma focus --- the vertical or the horizontal dimension?

My point…

- Yes, we can mentor and develop others in statistical thinking and in working for improvement
- But . . . We ought not assume that our mathematical skills give us competitive advantage. We may have some learning to do.

An example

- A (formerly) young graduate student named “Doug.”
  - Perhaps the best “question asker” I have observed at work at the craft.
  - One of the best listeners I have ever observed at work at the craft.

  Where did Doug learn these skills?

If we want to raise the level of statistical thinking, we must…

- Be practitioners ourselves
- Mentor others in the practice