

Statway

What worked well and what we're improving

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<http://www.austincc.edu/mparker/talks/>

Learn more about this

Links on my website to

- Charles A. Dana Center
Many of the lessons (activities) and articles about this.
- Carnegie Foundation for the Advancement of Teaching
MANY videos, articles, etc. about the design

What is Statway?

Developmental math students

- go to and through a college-level math course
- faster
- and with higher success rates
- than the norm for developmental math.

For whom?

Students

- who place INTO Elementary Algebra
and
- who can satisfy their college math requirement with one statistics course.

Footnote: Reading skills

Successful? (Data)

All colleges: average completion rate for full sequence was 52%.

Our school: Completion rate for full sequence 53%.

Compare to: 7% or maybe 2% or less
(Complete 2 courses or complete a college-level course in two semesters.)

Successful? (Student comments)

- “First math course where I feel like I *understand* anything.”
- “My favorite college course. No one has ever let me talk about what I’m thinking so much.”
- “When I read articles in the newspaper that talk about data, I feel like I know understand what they’re talking about.”
- “Quit telling us stuff now. We need to get into our groups and figure it out.”

Successful? (Teachers)

- Almost all Statway students are very strong on concepts even when they are struggling with computations.
- Most Statway students remain more engaged throughout the course – finding statistics in the newspaper and on the job, and talking about it.

(Compared to lower half of students in regular statistics course.)

Successful? Standards

- Common final exams
- Final exams were also calibrated with some university-level statistics classes.
- Statway students' scores were comparable to those of the university students completing their statistics courses.

Main Challenge

Getting the students enrolled in the class.

Different pathways to college-level math makes this a "hard sell" to advisers.

Student's future education plans and career plans are often not so solid as to make it clear whether they will need College Algebra.

Lessons Learned: Habits of Mind

Changing students' "habits of mind" is absolutely central and can be done.

- signing course contracts in small groups
- starting about a third of the classroom days with a "rich task"
- discussion of "how your brain works"
- engaging their imagination through play and simulation. Example: card game to illustrate the basics of hypothesis testing

Lessons Learned: Activities

We can cover the material in a course with student-centered inquiry and discoveries taking up most of the time, if we structure the activities well. (Typically an instructor version of our 50 minute activities was 12 - 15 pages.)

See materials on the Dana Center website. Lesson 3.1.1 is a great example. (Introducing scatterplots.)

Lessons Learned: Text

Essential: Textbook materials that keep students focused on the concepts as they practice doing the techniques.

Many multiple choice questions focused on concepts, with the incorrect choices being the four or five usual mistakes in interpretation students make.

Lessons Learned: Text (cont.)

- All exercises have context.
- Context is simple enough that students can really see it and use it to think about problem.

(My best students said that was essential to their success in this course after so much failure in learning math before.)

Read more

- **Carnegie Foundation for the Advancement of Teaching** (includes many videos and articles about the design principles and research supporting them)
<http://www.carnegiefoundation.org/statway/statway-resources>
- **Charles A Dana Center** (includes about a third of the actual activities, with instructor notes)
<http://www.utdanacenter.org/mathways/index.php>
- This presentation: <http://www.austincc.edu/mparker/talks/>

Future Plans

After the initial work, the Carnegie Foundation and the Dana Center have taken different paths with their jointly developed original set of activities.

- Carnegie Foundation
 - Networked Improvement Community (NIC)
 - Bring in a few more schools at a time.
 - Statway and Quantway are their trademarked names.
- Dana Center
 - Will have a common first course, followed by a Math Pathway statistics course and a Math Pathway quantitative literacy course.
 - In about a year, will work on a Math Pathway STEM course.

Extra slides - in case there's time!

Design Principles

- Evidence-based practices to support success
- Activity based – not lecture based
- Explicit connections to concepts
- Deliberate practice
- Productive struggle

Curriculum Materials

- Carefully crafted classroom activity lessons to support the students in constructing knowledge themselves.
- Online “textbook” with built-in formative assessment. Very complete data collected from the online textbook.
- Test questions provided for teachers to choose among.

What worked well in the curriculum?

- Activity-based class and learning communities
- Productive struggle
- Explicit connections to concepts

The curriculum materials supported the first two of these with readings and activities. Class time was allocated for these.

The curriculum was strongly organized around concepts.

What we're working on

- Refining the individual activities
- Making the activities and the online book “cohere” better.
- Providing better support for the developmental math review.