Quantitative Reasoning at The New School

Saturday, October 12, 2012
Carol Overby
Laurie Tvedt
Non-traditional students are best served by quantitative education that applies directly to their work and civic engagement.
Quantitative Reasoning Students at The New School

- University has a mission of civic engagement
- Two different student populations
  - Traditional-aged students in a design setting: BBA Program
  - Non-traditional students in a degree-completion Bachelors Program
- Two different Quantitative Reasoning courses
Parsons BBA students are different

- They have art and design talents and training
- Their learning styles skew toward feeling rather than thinking (Kolb model);
- And toward visual/tactile rather than auditory (VARK model)
- They are embracing careers in design and innovation
Parsons curriculum is different

- Balance of design, liberal arts, and business courses
- Centrality of projects and internships
- Studio methods of teaching: demonstrate/create/critique
- Quantitative skills for research and modeling
Algebra/Stats and QR courses have fallen short

- “the material didn’t seem to have a practical application; it wasn’t specific to Design + Management”

- “the instructor is good at math but doesn’t communicate effectively with those who don’t understand” “…didn’t understand how creatives are different”

- “the readings helped me with concepts, but I’m better with hands-on or physical”

- Students come to later courses with poor quantitative skills
The current curriculum does not integrate quantitative concepts

- Subsequent courses do not apply the quantitative concepts learned...

- until two years later (in Financial Management) very-basic quantitative skills have to be re-introduced
Two new courses, QR 1 and QR 2, address these issues with

- Visual methods of teaching and learning
- Emphasis on most-important concepts: proportions and variables
- Immediate applicability of concepts via research and modeling projects
Visual and studio learning methods improve student engagement

- QR1 and QR2 utilize the prototype/critique/reiteration model of design learning
- Students use and create visuals each week in QR1

### QR1: Weekly

<table>
<thead>
<tr>
<th>Topics</th>
<th>Mast readings</th>
<th>visualization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1-2 Problem Framing and Back of the Envelope Calculations; intro to Excel</td>
<td>Fermi, ch 1</td>
<td>sketch</td>
</tr>
<tr>
<td>Week 3-4 Estimation and Unit Conversion; Rates of Change</td>
<td>ch2 (ch4?)</td>
<td>exccel</td>
</tr>
<tr>
<td>Week 5 Language of comparisons: compared to what; apples to apples</td>
<td>ch 3</td>
<td></td>
</tr>
<tr>
<td>Week 6-7 Percentages: parts of a whole; additive (linear growth): Sales Tax and inflation (solving for previous value, rate, later value) Excel problems</td>
<td>ch 3</td>
<td>pie charts</td>
</tr>
<tr>
<td>Linear Models of Growth (Rates of Change; Inflation)</td>
<td>ch 4</td>
<td>bar &amp; line graphs</td>
</tr>
<tr>
<td>Week 8 Intro to Data; Averages, Histograms and Visual Representations of Data</td>
<td>ch 5</td>
<td>histogram</td>
</tr>
<tr>
<td>Week 9-10 Organizing Data: Income Distribution, Percentiles, Measures</td>
<td>ch 6 inc distr</td>
<td>bar &amp; pie charts</td>
</tr>
</tbody>
</table>
Visual and studio learning methods improve student engagement

- Deliberate links are made to concurrent and later design courses
Visual and studio learning methods improve student engagement

- Later management courses incorporate graphing and sketching
Both courses show immediate applicability of concepts

- QR1 emphasizes and illustrates proportions and growth
- QR1 models the use of variables
- QR2 presents research methodologies within projects
- QR2 is directly followed by qualitative/blended research methodology courses
New School Bachelors Program
Students are Different

- They are working adults who need to apply skills immediately
- Their curriculum is completely self-designed with no prerequisites
- Most are completing an interrupted degree
- They have identified specific skills they are lacking
Students’ reasons for taking the course are different

- They want to feel more comfortable with the numbers they encounter at their current jobs
- They’ve noticed that numerate colleagues are more likely to be promoted
- As entrepreneurs, they need to understand their business’s numbers
How to Convince with Numbers, a new course in 2011, addresses these issues

- Relates directly to their current work or passion
- Students choose their own research topics
- Students acquire specific research and spreadsheet skills
- Focus is on understanding numeric relationships rather than formulas
Projects provide experiential learning

- Primary research projects include executing a survey and analyzing results
- Weekly assignments incorporate research findings that will be used in the final project
- Students present and defend a thesis using secondary research data
Students report immediate outcomes

- “Since taking this course, I’ve become a better listener, especially in meetings at my job, to ask the right questions and take the next step”

- “I question sources and what they’re trying to sell me”

- “The final project opened up my mindset beyond a longstanding idea and changed my perspective by my really looking at the research”
Students attributed success to several elements

- [It was very important that] “our instructor was knowledgeable about industry. She had good stories about clients, and had applied these quantitative methods herself.”

- “Stepped assignments helped me learn time management.”

- “The most important things I learned were research skills and how to apply information.”
Quantitative Reasoning at
The New School

Saturday, October 12, 2012
Carol Overby
Laurie Tvedt