

# Quality & University Education

Michael J. Armstrong  
Associate Professor  
Goodman School of Business  
Brock University  
[michael.armstrong@brocku.ca](mailto:michael.armstrong@brocku.ca)

# Overview

- Learning about quality
  - Teaching, professional practice, research
- Quality of learning
  - Process improvement, process control
- A collection of short stories
- I am the narrator, not the protagonist
- Please ask questions!

# About me

- BSc, MBA, PhD
- CMQOE, CSSBB, etc.
- 6 years in aircraft maintenance
- 3 years at RMC
- 7 years at Carleton U
- At Brock U since 2008

# Learning about Quality

- Teaching students about quality
- Brock
  - Over 18,000 students
  - Business school
  - Health sciences
  - Wine, Statistics, etc.
  - (No engineering)

# Credit courses

- BBA course: 35-45 students/year
- MBA course: new this fall – interested?
- Improvement via Lean Six Sigma
  - Tools: DMAIC, SPC, ANOVA, regression
  - Context: culture, cost of quality, ISO 9000
  - Certification coverage: CQPA, CSSGB
  - Guest speakers – interested?
  - ASQ branch prize – thanks!

# Student projects

- Business students for credit or as volunteer
  - 1 day/week with local client, with me coaching
  - Example: Canadian Mental Health Association
    - Mapped counselling application procedure & waiting times
- Inter-professional Education for Quality Improvement Program (Madelyn Law)
  - Brock health sciences students work with McMaster medical students in a local health care agency
  - Example: St Catharines General & Hotel Dieu Shaver
    - Examined transfer and cross-servicing of patients

# Non-credit workshops

- Lean process improvement (2013+)
  - Small business, not-for-profit, government
  - Process mapping, 5S, setup time reduction, etc.
- Healthcare process improvement (2014+)
  - MDs, nurses, staff, etc.
  - Focus on medical examples
- Quality for start-ups (2015+)
  - Entrepreneurs
  - Product design, QFD, iteration

# Wine quality

- Cool Climate Oenology and Viticulture Institute (CCOVI)
  - <http://www.brocku.ca/ccovi/>
- Research, continuing education, outreach
  - Grape-growing: Reynolds, Wilworth
  - Wine-making: Kemp, Inglis
  - Taste perception: Pickering, Mantonakis



# Quality of Learning

- Quality improvement
  - Small scale, individual professors and processes
- Quality control
  - Large scale, overall universities and programs
- Similarities to Six Sigma v. ISO 9000 in business
- Similarities to health care
- Note that LEARNING is the core process
  - TEACHING supports that process

# Improving learning

- Brock U: A-Z Learning Services
  - Helps students become better learners
- Workshops on time management, essay writing, exam preparation, etc.
- Online mini-courses on remedial math, grammar, etc.
- Drop-in consultations

# Improving teaching

- Brock U: Centre for Pedagogical Innovation
  - Helps professors become better teachers
- Example: “Lean” testing
  - Replace 1 big mid-term test with 4-5 quizzes
  - Average cycle time drops from 4.3 to 1.4 weeks
  - Students receive feedback faster
  - Encouraged to study regularly
  - Instructors have smoother work flow
  - (Sometimes clashes with other university habits)

# Improving support

- Carleton U: Office of Quality Initiatives
  - Helps staff conduct benchmarking projects
- Example: Benchmarking residence applications
  - Compared CU's procedure to 4 other institutions
  - Adapted ideas for process re-design & automation
  - Students received room confirmations sooner
  - Vacancy rate fell from 3.4% to 0.8%
  - "Benchmarking goes to school", *Quality Progress*, May 2007, pp 54-58

# Improving via research

- Brock U: Chancellor's Chair for Teaching Excellence
  - 2 project grants each year of \$15,000
- Example: Course repeating (“rework”)
  - 25% of business students re-take at least 1 course
  - Average gain of 15 points, but very wide range
  - $\text{NewGrade} \approx \frac{1}{2}(\text{OldGrade} + \text{Average}) + 10$
  - Repeater Pass > First Timer > Repeater Fail

# What is (a) quality education?

- Education has similarities to health care
  - Complex public-sector intangible service
  - Delivered by quasi-independent experts
  - Client evaluations mostly rely on credence
  - Expensive (but less so)
  - Clients actively participate (but more so)
- Measuring and improving quality is difficult

# Measuring

- Inputs (accounting view)
  - Professor qualifications, student attributes, lab spaces, per capita budgets
- Process (operations view)
  - Mean time to completion, retention rate
- Outputs (marketing view)
  - Surveys (NSSE), starting salaries, alumni networks

# Thanks for Listening

- Questions? Comments?
- Engage a student!
  - Term projects
  - Co-op internships and summer jobs
  - Full-time
- <http://brocku.ca/business/>
- [michael.armstrong@brocku.ca](mailto:michael.armstrong@brocku.ca)