IT and Analytics in the Wharton Curriculum

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Analytics at Wharton: All In…

Wharton School Forms Analytics at Wharton

CISION **PR Newswire** May 7, 2019

Brings together state-of-the-art analytical teaching, research, and industry engagement initiatives, funded by an anonymous $15 million gift

Wharton's Big Bet On The Analytics Boom

BY: JOHN A. BYRNE ON APRIL 21, 2018 | 2 COMMENTS 8,797 VIEWS

Analytics in the Curriculum

5,063 Students Spread Across Four Degree Programs

2,617 Undergraduates

1,784 MBA Students

463 EMBA Students

199 Doctoral Students

241 Standing Faculty Spread Across 10 Departments

<u>Undergraduate</u>
20 "Concentrations" (including STAT, OID, BA)
~20% of students choose Business Analytics
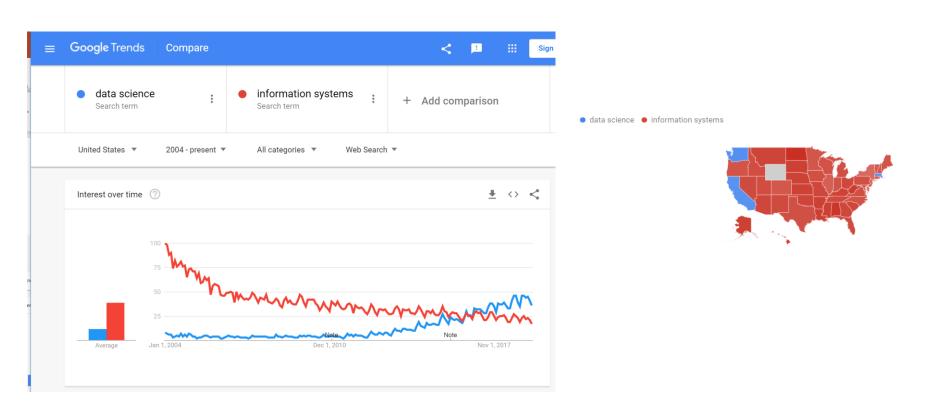(Electives: 31 Wharton, 7 External)

<u>MBA</u>
19 "Majors" (including STAT, OID, BA)
~14% of students choose Business Analytics
(Electives: 27 Wharton, 15 External)

50+ Directly involved in analytics teaching or other initiatives (official figure, probably low)

A PREDICTION THAT ANALYTICS WILL BE THE MOST POPULAR MAJOR AT WHARTON IN THREE YEARS (Eric Bradlow, Dean of Analytics, May 2018 in "Poets & Quants")

Demand Shocks and Curriculum Change

Questions:

How **should** we respond?

How **did** we respond?

Finding a path

- "Employers are demanding these skills"

  We're not a trade school
  (or if we are, we are very expensive!)

- "West Coast Alumni want us to…"

  Supporting the leading edge or the center of mass

- "I need a 3rd concentration…"

  Supporting meaningful student differentiation <u>and</u> a balanced education

- "I want to do AI …"

  Do you understanding what you are asking for… exactly?
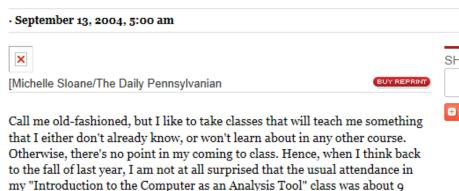
- "We need someone to teach…"

  Startup costs and the path of least resistance for faculty

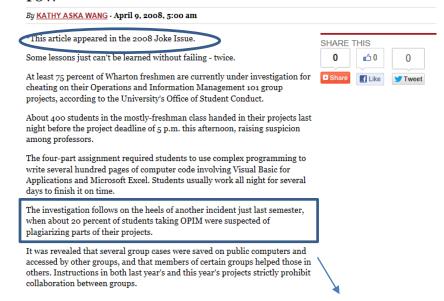# Lessons learned the hard way

Front Page Headline: **"OPIM Sucks!"**

OPIM 101 needs a serious makeover

· September 13, 2004, 5:00 am

[Michelle Sloane/The Daily Pennsylvanian

Call me old-fashioned, but I like to take classes that will teach me something that I either don't already know, or won't learn about in any other course. Otherwise, there's no point in my coming to class. Hence, when I think back to the fall of last year, I am not at all surprised that the usual attendance in my "Introduction to the Computer as an Analysis Tool" class was about 9 students -- out of 65.

Operations and Information Management 101 -- in its present state -- certainly deserves its reputation as the problem child of the Wharton core curriculum for the very reason that it fails to teach students anything that they won't gather from another Wharton class. Consequently, OPIM 101 should either undergo a hefty makeover or be scrapped altogether.

*Students caught cheating in OPIM 2nd year in a row

By KATHY ASKA WANG · April 9, 2008, 5:00 am

This article appeared in the 2008 Joke Issue.

Some lessons just can't be learned without failing - twice.

At least 75 percent of Wharton freshmen are currently under investigation for cheating on their Operations and Information Management 101 group projects, according to the University's Office of Student Conduct.

About 400 students in the mostly-freshman class handed in their projects last night before the project deadline of 5 p.m. this afternoon, raising suspicion among professors.

The four-part assignment required students to use complex programming to write several hundred pages of computer code involving Visual Basic for Applications and Microsoft Excel. Students usually work all night for several days to finish it on time.

The investigation follows on the heels of another incident just last semester, when about 20 percent of students taking OPIM were suspected of plagiarizing parts of their projects.

It was revealed that several group cases were saved on public computers and accessed by other groups, and that members of certain groups helped those in others. Instructions in both last year's and this year's projects strictly prohibit collaboration between groups.

SHARE THIS

... another incident last semester when about 20% of students taking OPIM were suspected of plagiarizing their projects

Analytics for Undergraduates: Business Analytics Concentration (~2014)

The **Business Analytics** joint concentration between the OID and STAT departments is designed to build deep competency in the skills needed to implement and oversee data-driven business decisions, including (i) collecting, managing and describing datasets, (ii) forming inferences and predictions from data and (iii) making optimal and robust decisions. Business analytics makes extensive use of statistical analysis and the applications of business analytics span all functional areas.

1. Data collection (c): methods for acquiring and manipulating data
2. Advanced data analysis (a): working with data sets in a computing environment
3. Optimization (o): computer-based prescriptive decision making

OIDD105 (c): Developing Tools for Data Access and Analysis
OIDD201X (o): Technology, Online Business Model Innovation, and Valuation
OIDD215 (a,c): Intro to Analytics and the Digital Economy
OIDD224 (o): Analytics for Service Operations
OIDD236 (o): Scaling Technology Ventures: Aligning Operations with Strategy
OIDD245 (a,c,o): Analytics and the Digital Economy
OIDD311 (c): Business Computer Languages
OIDD314 (a,c): Enabling Technologies
OIDD319: Advanced Decision Systems
OIDD321 (o): Management Science
OIDD325 (o): Thinking with Models
OIDD353 (o): Mathematical Models in Finance
OIDD380: Operations Strategy Practicum
OIDD410 (a): Data Mining for Business Intelligence

Notes

- Red is new
- These are essentially all regularly offered IS classes
- Non-OID on next page (this isn't the full list)

Business Analytics Concentration (other Wharton courses)

STAT405 (a,c): Statistical Computing with R (0.5 CU course)

STAT422 (a,c): Predictive Analytics (0.5 CU course)

STAT435 (a,o): Forecasting Methods for Management

STAT470 (a,c): Data Analytics and Statistical Computing

STAT471 (a,c): Modern Data Mining

STAT474 (a): Modern Regression for the Social, Behavioral and Biological Sciences

STAT475 (a,c): Sample Survey Design

STAT520 (a): Applied Econometrics I

LGST242: Big Data, Big Responsibilities: The Law and Ethics of Business Analytics

MKTG212 (a): Data and Analysis for Marketing Decisions

MKTG271 (a): Models for Marketing Strategy

MKTG309 (a,c): Experiments for Business Decision Making

MKTG352 (a,c): Marketing Analytics

MKTG476 (a): Applied Probability Models in Marketing

Analytics for Undergraduates: Flex Fundamentals

- Resulted from the 2016 Undergraduate Curriculum Redesign

- 1 cu of "Global" and 1 cu of …

  Technology, Innovation and Analytics

  Courses in this category reflect the varied ways in which technological advances have changed business practices. These courses focus on one or more of the following activities associated with technology: Innovation in products and services; innovation in processes or mechanisms to deliver products and services; management of the market and policy environments of new products and technologies; and applications and implications of new techniques for collecting, analyzing, and using data.

- Result: Some rebranding… lots of innovation…
  - Majority of courses are new
  - Every student exposed to analytics at intro level ~sophomore year
  - Encouraged broad participation by limiting number from any one department
    - Relaxing that requirement for capacity and diversity
    - No problem generating new, acceptable courses

ACCT 242: Accounting and Business Analysis
ACCT 270: Predictive Analytics Using Financial Disclosures
BEPP 207: Economics for the Next Hundred Years
BEPP 280: Applied Data Analysis
BEPP 284: Game Theory for Business and Life
HCMG 391: Health Care Entrepreneurship
LGST 222: Internet Law
LGST 242: Big Data, Big Responsibilities: The Law and Ethics of Business Analytics
MGMT 214: Technology Innovation and Strategy
MGMT 243: Work and Technology (0.5 CU)
MGMT 267: Entrepreneurship and Technological Innovation (0.5 CU)
MKTG 270: Digital Social and E-commerce Marketing
MKTG 476: Applied Probability Models in marketing
OIDD 201: Technology, Online Business Models and Valuation (no longer offered) (0.5 CU)
OIDD 201: Technology, Online Business Models and Valuation
OIDD 215: Analytics and the Digital Economy (no longer offered) (0.5 CU)
OIDD 245: Analytics and the Digital Economy
REAL 375: Real Estate Disruptions
STAT 405: Introduction to Programming in R (0.5 CU)
STAT 422: Predictive Analytics (0.5 CU)
WH 150: Evaluating Evidence

Some data:
Delivered 700 cu in 2019...
Including 120 cu to non-Wharton students
Demand generation effects
Capacity utilization ranges from 70-100% (have not yet exhausted potential demand)

Analytics for MBAs (?): Making Progress

- 2014 Curriculum Redesign
  - "Flex core" led to a restructuring of some OID offerings to be Analytics oriented

Take two of the following* (see course descriptions):

OIDD 611: Quality and Productivity (0.5 CU)

OIDD 612: Business Analytics (0.5 CU)

OIDD 613: Information Technology and Business Transformation (0.5 CU)

OIDD 614: Innovation (0.5 CU)

OIDD 615: Operations Strategy (0.5 CU)

- Business Analytics Major (similar to undergrad) has high demand
  - One slight (unexpected) difference: surprising number of MBAs taking upper level CSE

- Issue
  - Vastly more heterogeneity
  - …which is creating a greater gap between supply and demand than ideal
  - … for which easy solutions are not attractive.

Looking forward

- External pressures transforming IS groups into business analytics groups
  - Challenge for defining an advantage relative to other disciplines – Marketing, Stat, Accounting – that were "there first" as well

- Demand increase has brought in students who we would not normally see
  - Communicating clearly what is involved
  - Managing class heterogeneity in technical skills
    - "Analytics without coding" seems like a promising paradigm

- Flexibility/voluntary participation is important
  - Good news: supply side has not been a problem here

- Best practices for serving MBAs still evolving