



# Learning By Doing or Learning by Listening?

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# Outline

- Learning by Doing – what is it?
  - Curriculum development
  - The eBusiness Technology Master's Program
  - Delivery modes
  - Lessons learned
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- Based on ideas of Herbert Simon (Economics Nobel Prize) and Roger Schank (Learning Methodology)

# Learning By Doing

- University teaching is largely “learning by listening” (with some structured homework)
- Studies show:
  - Only 10% of material presented in class is retained by the end of that class
  - Only 3% retained by the final exam
  - Only 1% retained one year later
- Classes do not and cannot teach skills
  - Imagine a lecture on how to ride a bicycle
- Jobs require skills
- Therefore, **DON'T GIVE CLASSES** to people who want skills

# Task-Oriented Curriculum

- What to do instead?
- Develop a realistic scenario
- Give students roles in the scenario
- Have the students do what their characters would do
- Work as teams under the guidance of faculty to produce work product
  - In eBusiness Technology: reports, system designs, software
- Faculty evaluate final work product, assign grades

# Creating a Curriculum

- Faculty (often 10 or more) meet regularly to devise a list of skills all students should possess
- Once the skill list is agreed, faculty create tasks
- Each task requires mastery of at least one skill, usually several
- Students work full-time on each task in teams, usually for 2-3 weeks
- Output
  - Professional work-product
  - Public persuasive presentation
  - Individual evaluations

# The Task Matrix

- Rows are skills from the skill list
- Columns are tasks
- Each skill is required in at least one task, so each row must have at least one X
- There are usually far more skills than tasks (e.g. 50 vs. 16)

	Task 1	Task 2	Task 3	Task 4	...
Skill 1			X		
Skill 2		X			
Skill 3		X			
Skill 4	X			X	
...					

# Task Materials

- Each task begins with a problem statement, assignment or memo
- The students are given an overview of the field pertinent to the task (a lecture)
- The task is explained in detail
- A large body of references (many irrelevant) is provided
- A “step-by-step guide” is created to provide a starting point

# Metaskills

- Team formation and management
- Accommodating different talents, background, cultures
- Interpreting ill-formed and incomplete problem statements
- Triage: dividing reference material into three categories:
  - Irrelevant
  - Clearly relevant
  - Possibly relevant, therefore requiring further attention

# Metaskills

- Consulting skills
- Presentation skills
- Time management
- Dealing with illness, personal crises & difficulties
- HOW TO LEARN, instead of HOW TO BE TAUGHT

# eBusiness Technology

- Master of Science in Information Technology (MSIT)
- Program objective:
  - Graduates who can design and direct implementation of eBusiness systems
- Program orientation
  - Not a business degree, but a technology degree immersed in business applications
- Job objective
  - Manage eBusiness system development
  - eBusiness consulting
  - Startups

# ebConsultants LLP

- Students are beginning employees in the eBusiness Task Force of ebConsultants LLP
- They report to Ajit Singh, Director of eBusiness Consulting
- Dr. Singh reports to Jocelyn Whitney, Managing Partner
- The faculty are also consultants to ebConsultants
- Receive realistic assignments come from Dr. Singh
- Everything is realistic



# Program Design

- 16 tasks
- No eBusiness classes
  - Students learn as teams with guidance from faculty
- Everyone takes one course per semester
  - Fall: 15-600 Introductory/Intermediate Programming
  - Spring: Elective
  - Summer: Elective
- 1 Practicum (8 weeks)

# eBusiness Tasks

- 1 Ubiquitous computing
- 2 Requirements Analysis
- 3 Contextual Design
- 4 User Interface Design and Testing

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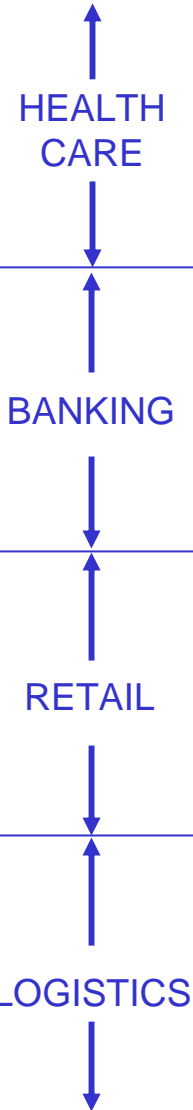
- 5 Database and Detailed Design
- 6 Network Infrastructure, Wireless
- 7 Web Services
- 8 Web Application Development

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- 9 ERP, Supply Chain
- 10 Privacy Technology
- 11 Discovery Technology
- 12 Data Mining

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- 13 Information Security
- 14 Mobile eCommerce
- 15 Negotiation
- 16 ePayment



# Program Structure

- Teams of five
- Rotate through all 4 practice groups
- Team composition changes each quarter
- Tasks start with a task memo
- Work product is joint
- Tasks end with a presentation to the “client”

# eBusiness Curriculum Development

- Staff: 10 faculty (9 Computer Science, 1 Business), 3 educational specialists, 3 scenario writers
- Development time: 1 year
- Cost: \$1 million
  
- Eventually produced list of 51 skills; took 3 months

# Grading

- Fundamental problem: how to give fair individual grades for group projects
- Consulting faculty (task experts) evaluate work product
- Program faculty evaluate metaskills
- Consulting faculty generate grades
- **ONLY POSSIBLE GRADES: A, B, C, F**
- F in any task means the task must be repeated

# Task Grading

	Team Evaluation (1/2)	Individual Evaluation (1/2)
Technical Skills (2/3)	1/3	1/3
Professional Skills (1/3)	1/6	1/6

# Practicum

- A real problem supplied by a real, paying company
- 8 weeks long
- US \$10,000 prize for the winning team, determined by independent judges
  
- We have done over 40 practicums in the past 7 years

# eCommerce Practicum

- A real problem from a real company that pays real money for a solution. 33 Practicums from 24 sponsors:



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# Delivery Modes

- Full-time, on-campus
  - Successful
- Part-time, on-campus
  - Workable
- Full-time, remote
  - Feasible with dedicated students
- Part-time, remote
  - Very difficult to manage; nearly impossible

# Lessons Learned

- Learning by doing is MUCH MORE EFFECTIVE than traditional classes
- Students complain about it because it's a lot of work
- Fair grading is extremely difficult
- Employers have difficulty understanding what It produces
- Students slide easily into professional employment

# Q&A