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Dimensions of Online Courses and and Student Perceptions

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Center for Excellence & Innovation in Teaching (CEIT)

Outline

- Intro: Online Learning in the Mainstream
- Relevant Learning Theories
- Major Factors for Overall Course Perception
- Course Size—Student Satisfaction Relationship
- Conclusion and Future Work

Online Education 2013

Enrolment in Degree Granting Postsecondary Institutions

(online – at least one online course per year) Sloan Consortium Survey Report, January 2013

	Total Enrolment	**% Change Total Enrolment**	**Online Enrolment**	**% Change Online Enrolment**
Fall 2009	20,427,711	6.9%	5,579,022	21.1%
Fall 2010	21,016,126	2.9%	6,142,280	10.1%
Fall 2011	20,994,113	**-0.1%**	6,714,792	9.3%

→ **MOOCs**

→ **Disruptive Technology** in **Critical & Conservative Field**

→ Need to Understand **Factors Determining Online Experience**

MOOC	Credit-Bearing, Tuition Charging Online Programs
Automated Grading or Peer Grading	Instructor/Facilitator grades essays, case studies, free style solution grading with individual feedback, team projects with live project presentations, etc.
No direct Interaction with professor or graduate assistant	Daily direct discussion with instructor and facilitators
100% Asynchronous Communication	Live classroom, office hours with instructors and facilitators: goal to become weekly requirement in all courses
No academic advising on courses, degree options, etc.	Advising in the academic program
Minimal or no student services (administrative or technology) during course delivery	Student support services in DE & academic department. Ideally 24/7; realistically extended business hours and some weekend/holiday hours

Learning Theories—Distributed Cognition

Distributed cognition (Hutchins): theoretical framework for studying distributive aspects of cognitive processes across people, the physical environment, time and/or space. In the online context distribution occurs across:

- students, professors, facilitators, student support, and system support.
- *cognitive artifacts* of the material environment such as textbooks, the courseware system, the online content with its multimedia components (text, graphics, videos, simulations, etc.),
- the type of assessments (homework assignments, reviews, projects, quizzes, exams, presentations), virtual laboratories
- time and space

While learning and science are by nature cognitive and distributed, the complexity increases when online

Learning Theories—Multimedia

- *Cognitive theories of multimedia* explore how different modalities alone or/and in combination impact the learning process (Mayer et al. 1992)
  - involving multiple modalities enhance learning
  - modalities have different impact, e.g. words better retained when presented as auditory narration
  - contiguity principle: integrating words & pictures contiguously in time & space increases effectiveness

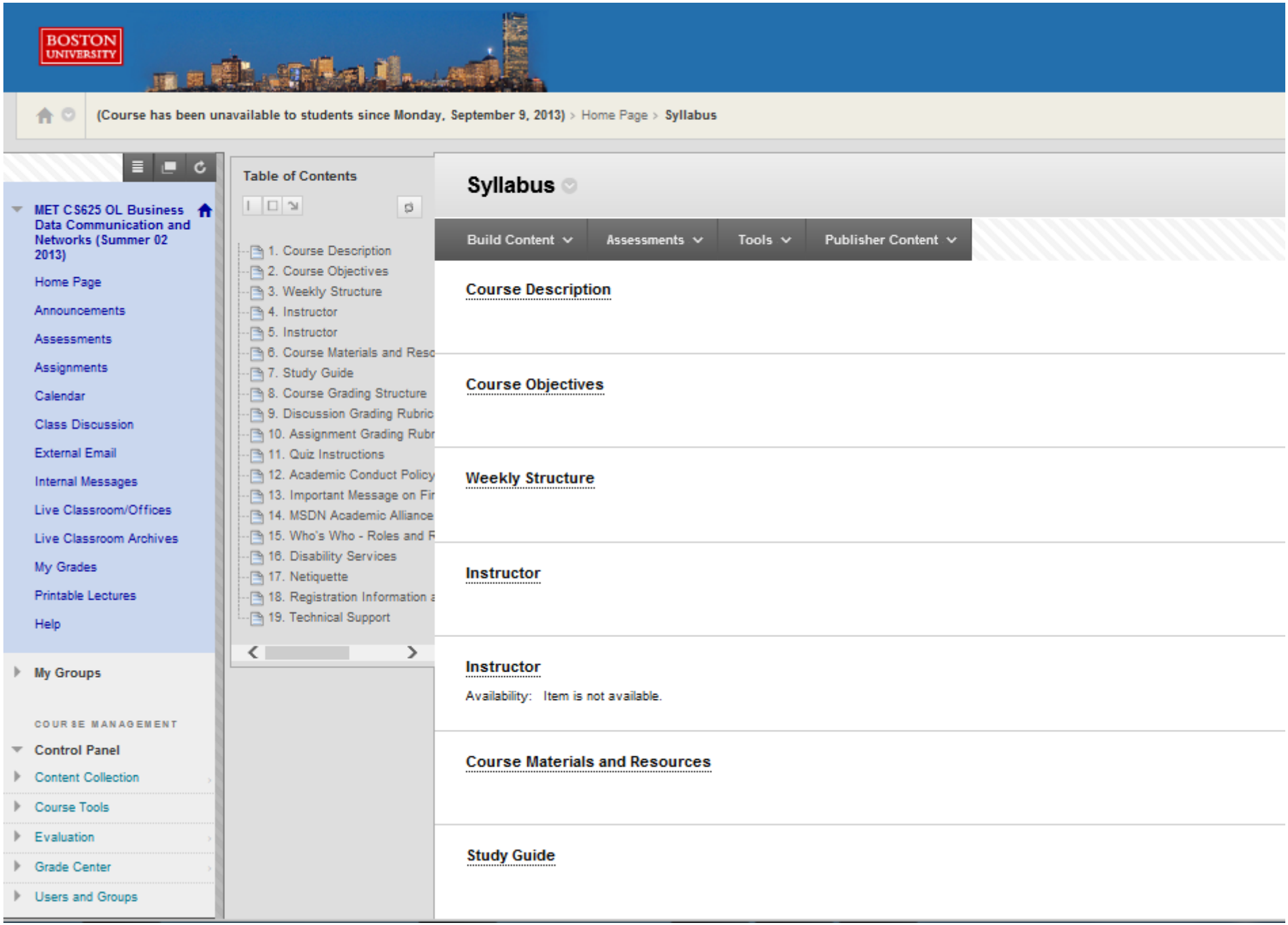
Learning Theories—Distance

- *Tom Allen (organizational behavior).* Somewhat counter-intuitively "the more often we see someone face-to-face, the more likely it is that we will telephone the person or communicate in some other medium (Allen & Henn, 2006)". This holds independent of communication mediums (phone, internet, etc.) and price
- *Transactional distance* (distance learning Moore et al. 1993) "psychological and communication space … between teacher and learner" determined by
  - structure (course materials & activities): increases distance
  - dialog: decreases distance
  - learner autonomy: higher autonomy needed for large distance

  Lacks quantitative assessment

Online Education at BU's Metropolitan College

- 1996-2002 synchronous videoconferencing (Picturetel, Foxboro Company)
- 2000: first blended (online and face-to-face) Graduate Certificate in in Database and Client/Server (Keane, Inc.)
- 2002 M Criminal Justice—first fully online program **[2013: ca 400 students]**
- 2003 MS in Management **[2013: ca 550 students]**
- 2004 MSCIS (data in this study) **[2013: ca 570 students]**
  - 7 week **intensive course format**:
  - course staffing: 1 full-time faculty, 1 facilitator per 15 students → **scalable**
  - Blackboard Vista: online lectures, video, graphics, online forums: **multimedia**
  - videoconferencing (Live Classroom & Live Office): **synchronous component**
  - virtual laboratories: **hands-on**
  - weekly assignments & mandatory proctored final: **self-paced within time framework**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(Course has been unavailable to students since Monday, September 9, 2013) › Home Page › Syllabus
MET CS625 OL Business Data Communication and Networks (Summer 02 2013)
Home Page
Announcements
Assessments
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Class Discussion
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My Grades
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COURSE MANAGEMENT
Control Panel
Content Collection
Course Tools
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Grade Center
Users and Groups
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1. Course Description
2. Course Objectives
3. Weekly Structure
4. Instructor
5. Instructor
6. Course Materials and Resc
7. Study Guide
8. Course Grading Structure
9. Discussion Grading Rubric
10. Assignment Grading Rubr
11. Quiz Instructions
12. Academic Conduct Policy
13. Important Message on Fir
14. MSDN Academic Alliance
15. Who's Who - Roles and F
16. Disability Services
17. Netiquette
18. Registration Information a
19. Technical Support
Syllabus
Build Content
Assessments
Tools
Publisher Content
Course Description
Course Objectives
Weekly Structure
Instructor
Instructor
Availability: Item is not available.
Course Materials and Resources
Study Guide

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MET CS625 OL Business Data Communication and Networks (Summer 02 2013)

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COURSE MANAGEMENT

Control Panel

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Home Page

Build Content | Assessments | Tools | Publisher Content

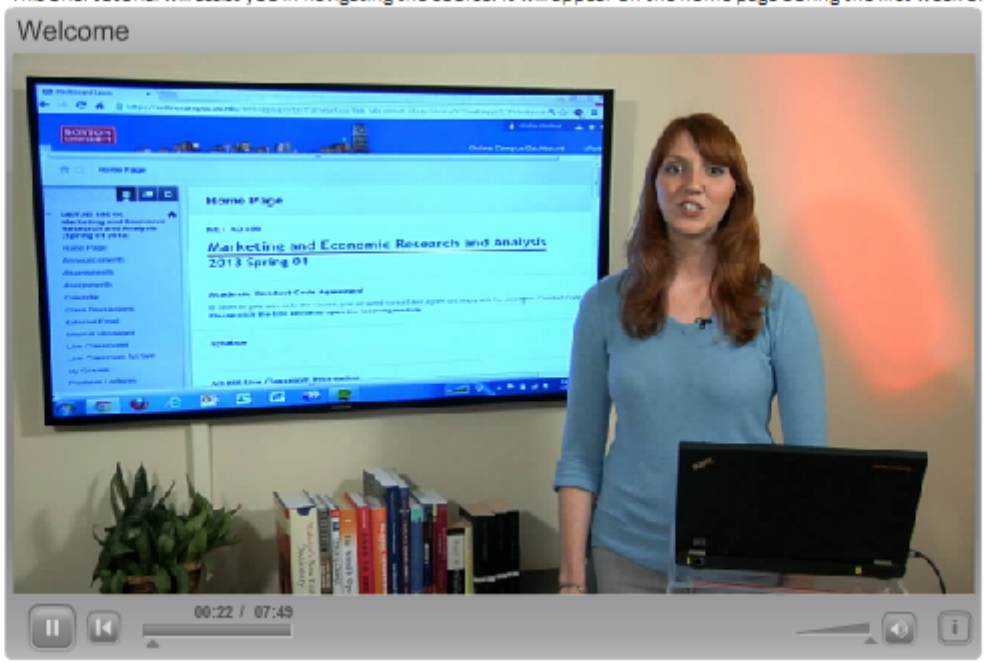
MET CS625

Business Data Communication and Networks

2013 Summer 2

Getting Around Online Campus

Availability: Item is no longer available. It was last available on Jul 14, 2013 11:59 PM.
Enabled: Statistics Tracking
This brief tutorial will assist you in navigating the course. It will appear on the home page during the first week of class.



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Introduction to Networking

If this item does not open automatically you can open Introduction to Networking here

Chapter 1 - Introduction to Networking

Introduction

There is probably no one taking this class who does not have some experience with networking. Certainly we all use, to varying degrees, a network on a daily basis. While the growth of networking has been explosive, and may seem to have sprung on the world all at once, there was a long development both in technology and in business. Both aspects of this development must be understood to have a grasp on how networking affects businesses and our lives.

Download

Table of Contents

1. Study Guide
2. Introduction to Networking
3. Terminology
4. How We Got Here - The First and Second Information Revolutions
5. The Development of the Telephony World Until 1970
6. The Development of the Computer Industry Until 1970
7. The Rise of Networking from the Confluence of Telephony and Computers

Parameters and Data

- Parameters
  - Student Evaluation Questionnaire: **30 questions** organized along three dimensions: **course overall, instructor, facilitator, technology**
  - Class Size
- Data
  - Aggregated data from **53** online courses with over **4,089** enrollments
  - response rate 27.78% to 59.62% with a mean of 52.38% and standard deviation 8.89%. A confidence interval of 95%, (mean response rates from 34.96 to 69.81) was computed and led to the exclusion of one class.

Methodology: Correlation and Multiple Regression Analysis

- Criterion: "*Overall Course Experience*"—
- Predictors drawn from remaining parameters, excluding parameters
  - in close to linear dependence ($r > 0.9$) with the predictor, such as "*I would recommend this course to others*"
  - addressing overall experience and do not yield information about specific aspects of course design, such as "*I would rate the instructor overall as*", "*The facilitators' overall rating is*", "*Overall, I would rate technology and support*"

Approach

- Determine statistically significant parameters within each parameter category (course, instructor, facilitator, technology
  - Exclude highly correlated pairs ($r > 0.7$) by running regression computation for all combinations of uncorrelated predictors and retaining the one with the largest R-Square
  - Regression yields statistically significant category parameters → **predictors for integrated model**
- Determine statistically significant parameters of integrated model

Course Dimension

Variable		Pr > |t| (p value < .05)
Intercept		0.0026
CC01	intellectually challenging	0.6046
CC02	**materials organized clearly**	**<.0001**
CC03	**discussion enhanced learning**	**0.0033**
CC04	**assignments furthered understanding**	**0.0019**
CC05	materials furthered understanding	0.2406
CC06a	animations/simulations enhanced	0.0609
CC06b	videos enhanced	0.3302
CC06d	video-conferencing enhanced	0.5253

Instructor Dimension

Variable	Pr > |t| (p value < .05)
Intercept	0.0028
CE09a ability to present	**<.0001**
CE10 grading criteria	**0.0013**
CE12 assignments returned timely	0.2730

Instructor Dimension

Variable	Pr > |t| (p value <.05)
Intercept	0.0028
CE09a ability to present	**<.0001**
CE10 grading criteria	**0.0013**
CE12 assignments returned timely	0.2730

Facilitator Dimension

Intercept	0.0309
FE14 facilitator feedback informative and clear	0.6794
FE15 assignments returned in a timely manner	0.2670
FE18 facilitators encourage questions/ discussion	**0.0047**

Educational Technology Dimension:
no statistically significant parameter!

Variable	Pr > |t| (p value < .05)
Intercept	0.1229
CT20 Navigation easy to access	0.0537
CT21 Instructions for technology use are clear	0.4273
CT22 Access and response time to courseware system	0.1746
CT23 Technology support	0.1432
CT24 Technical support timely	0.5790
CT25 Student services representative/manager:	0.3415

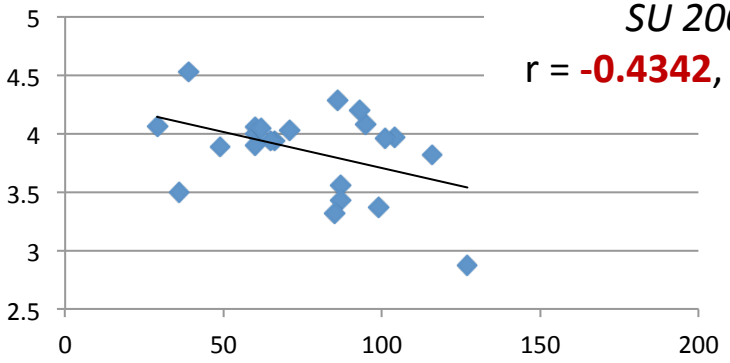
Online Experience Over Four Dimensions—Course, Instructor, Facilitator, Technology: **technology independent?**

Variable	Pr > |t| (p value < .05)
Intercept	0.0014
CC02 materials organized clearly	**0.0182**
CC03 discussion enhanced learning	**0.0539**
CC04 assignments furthered understanding	**0.0065**
CE09a instructor's ability to present	**0.0004**
CE10 grading criteria	0.0765
FE18 facilitators encourage questions/ discussions	0.7481
CT20 navigation easy access	0.2484

Class Size vs. Student Satisfaction

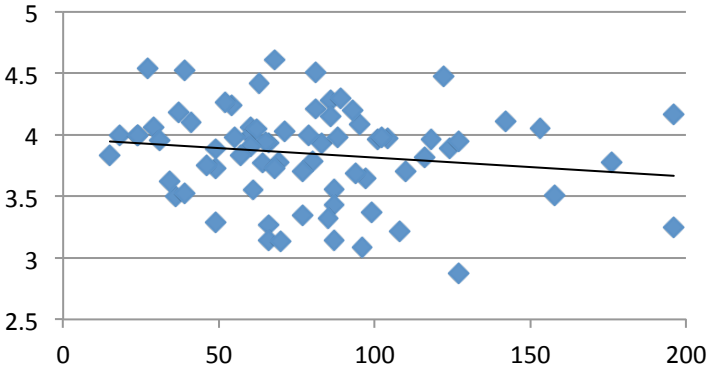
SU 2008-SP 2009

r = **-0.4342**, 22 cl.; 1,677 enrl



SU 2008-SP 2011

r = **-0.15655**, 75 cl.; 5,951 enrl.



SU 2009-SP 2010

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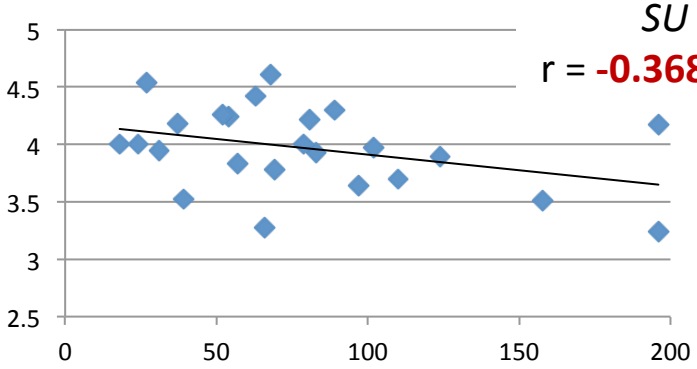

SU 2010-SP 2011

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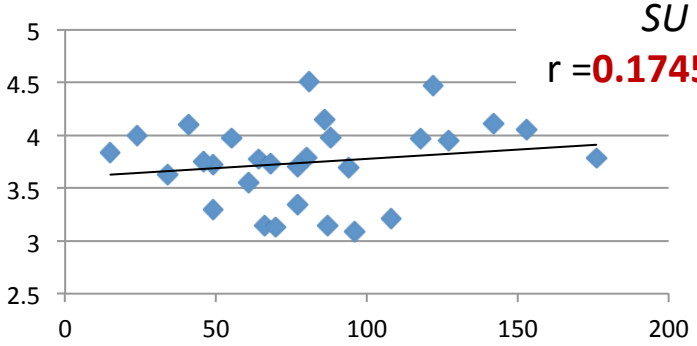

Conclusions

- Correlation and Regression Analysis:
  - Yielded four statistically significant parameters: materials organized clearly, discussions enhanced learning, assignments furthered understanding, instructor's ability to present
  - Technology impact inconclusive: may be included in overall course perception
- Class Size-Student Satisfaction Relation
  - proves more complex under closer inspection
  - suggest it improves with maturing of course and instructor experience and with the addition of synchronous component (video-collaborations, whiteboard discussions)

Future Work

- Major (statistically significant) Factors of Online Learning
  - correlation and regression analysis to include parameters for course content (lecture size, # graphic objects, videos, etc.), student assessment (homework assignments, quizzes, tests, discussions, etc.)
  - factor analysis to assess different subsets of student population
- Size vs. Student Satisfaction:
  - Longitudinal analysis of course clusters

PANEL

(3-5 min statements to initiate discussion)

- Coordinating the online course experience: faculty role for course material organization, grading, discussion:
  - Class size, group size, lead facilitator, : Lou
- Discussions—The Facilitator Viewpoint: Beth
- Synchronous component (discussions & short lectures, project presentations): when does it hurt and how to do it right?—Bob
- Course organization: video for problem solving —Anatoly