Meeting Instructors Halfway:
Use and Non-Use of Digital Learning Materials

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Today

What have instructors told us about their use of digital learning materials

— types

— motivations

— barriers

How do we work to what motivates instructors

How do we reduce the barriers they encounter

More Details about this Research

- Colleagues:
  - Flora McMartin, Broad-based Knowledge
  - Josh Morrill, Morrill Solutions Research
  - Ellen Iverson and Cathy Manduca, Carleton College
  - Glenda Morgan, George Mason University
  - Carrie Ouradnik, University of Wisconsin - Madison
- For more details visit
  - **http://serc.carleton.edu/facultypart**
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Research Questions

What do faculty members do with the online digital resources they find at digital libraries, online collections of open educational resources and so forth.

Do faculty value online educational resources?

How do they use these resources for teaching purposes?

What are the barriers to their use of both resources and digital libraries/collections?

Methodology

Focus groups (Fall 2005)

Code transcripts & determine themes

Survey design

Institution recruitment (Higher Education in the US)

Survey delivery (September 2006 - January 2007)

Analysis

Focus Group Findings

Personal definitions of DLs vary widely

Very few people knew about NSF DL efforts, OCW efforts, other campus repositories

— Not naming vs. not knowing

Barriers to use

— Information overload   — Concern about copyright and use

— Not invented here   — Persistence of resources

— Google

Focus Group Themes

1. Characteristics of useful online collections
    — Valued content, valued features, ease of use

2. Faculty work patterns
    — What, how & where they seek, why create/select curriculum, how used in teaching

3. Alignment between DLs and faculty work patterns
    — SOTL, PD, community of practice, research

4. Obstacles to faculty use of DLs
    — Prefer Google, no/low ROI, time consuming, lack of right content, lack of knowledge about DLs

5. Faculty use of Web for P&T purposes
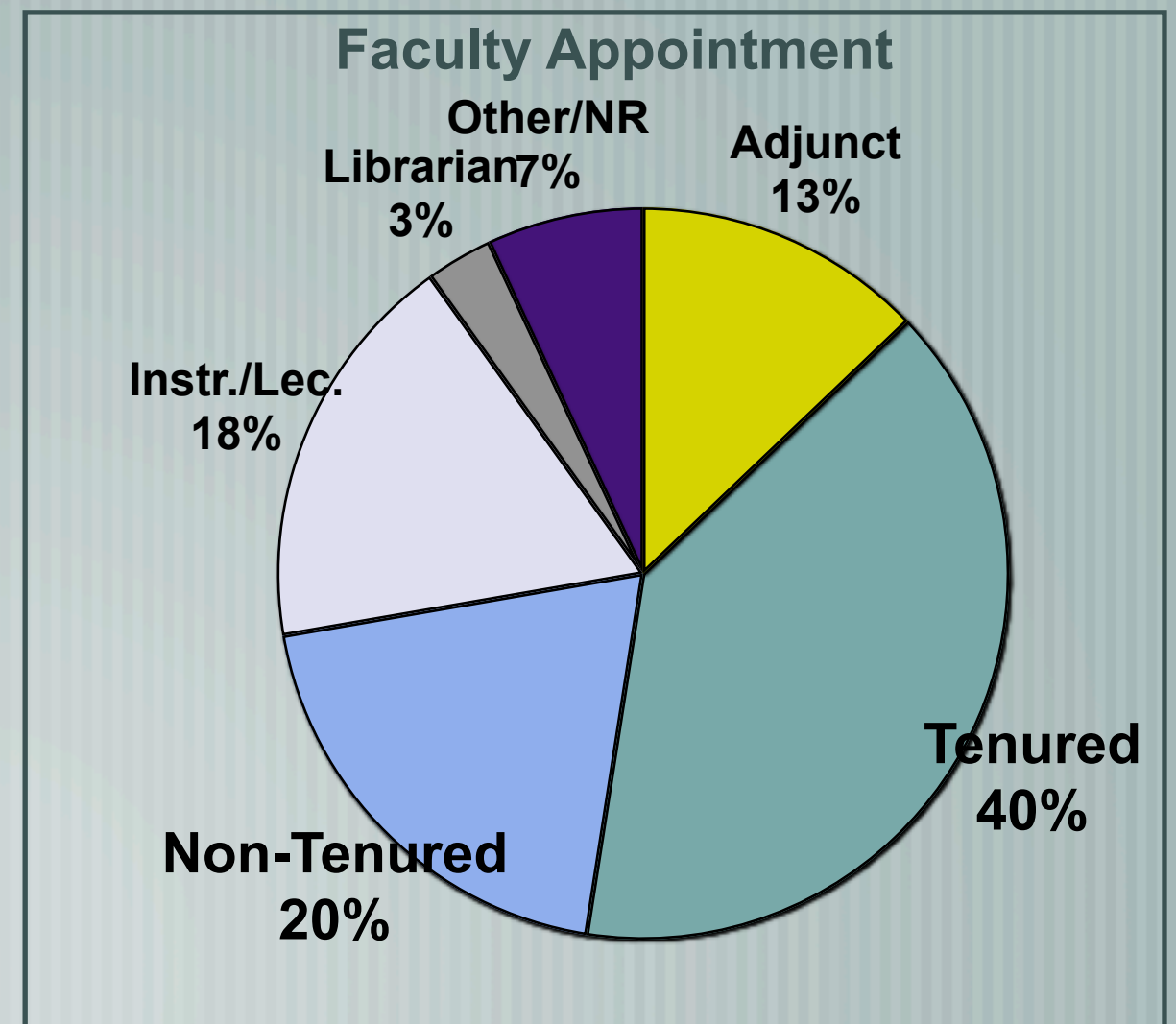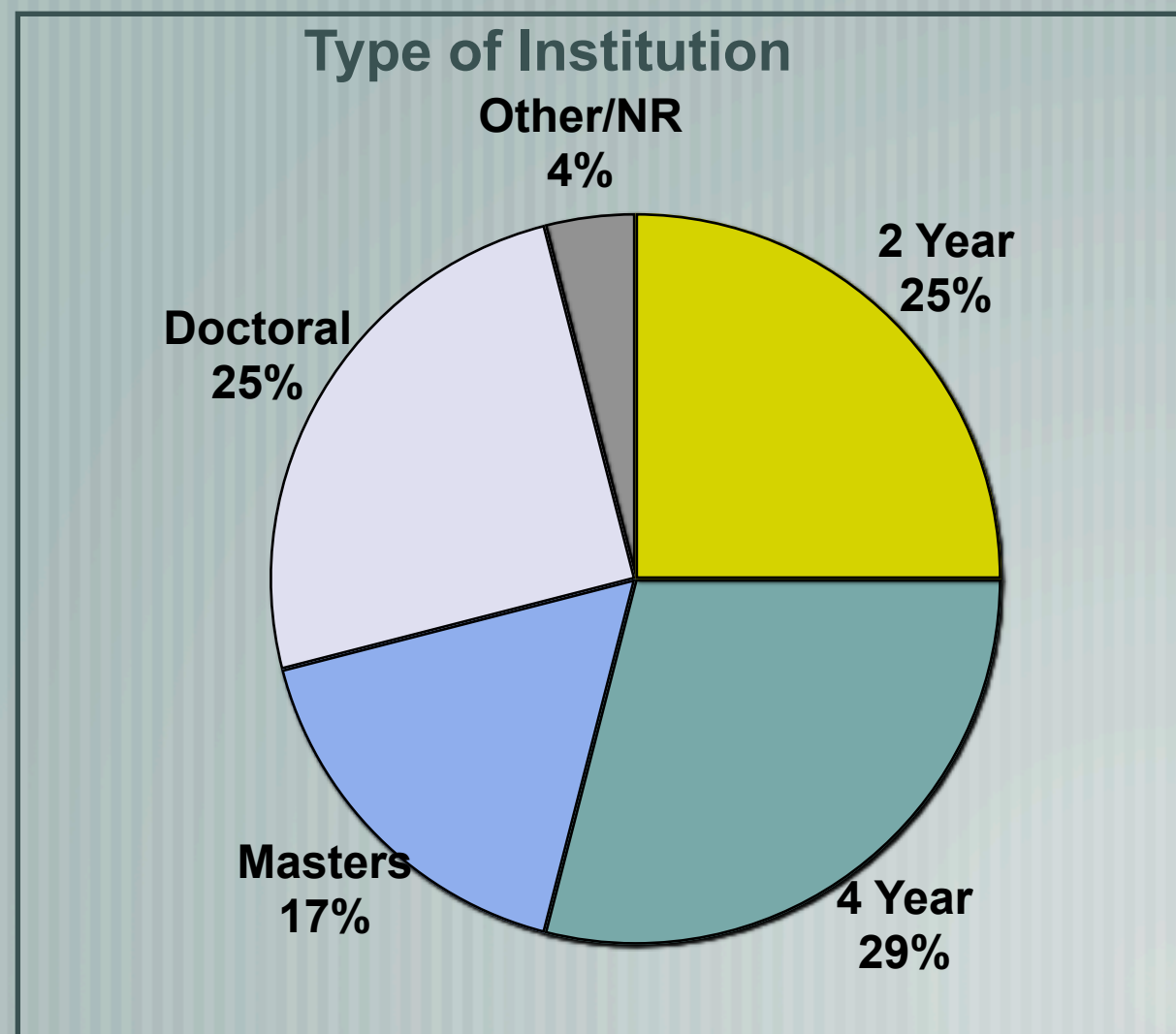   — Research, Service, Teaching

Survey design

Three Facets of Survey Validity

— Face Validity (does it seem right?)

— Extensive feedback, meetings

— External Validity (do other people think it clear, cohesive, right?)

— Pre-test w/ 20 faculty members, representative of sample, 6 in-depth interviews

— Internal Validity (measuring what you think your are measuring? Minimizing error)

— Reverse coding; Likert scales throughout, factor analysis & reliability testing
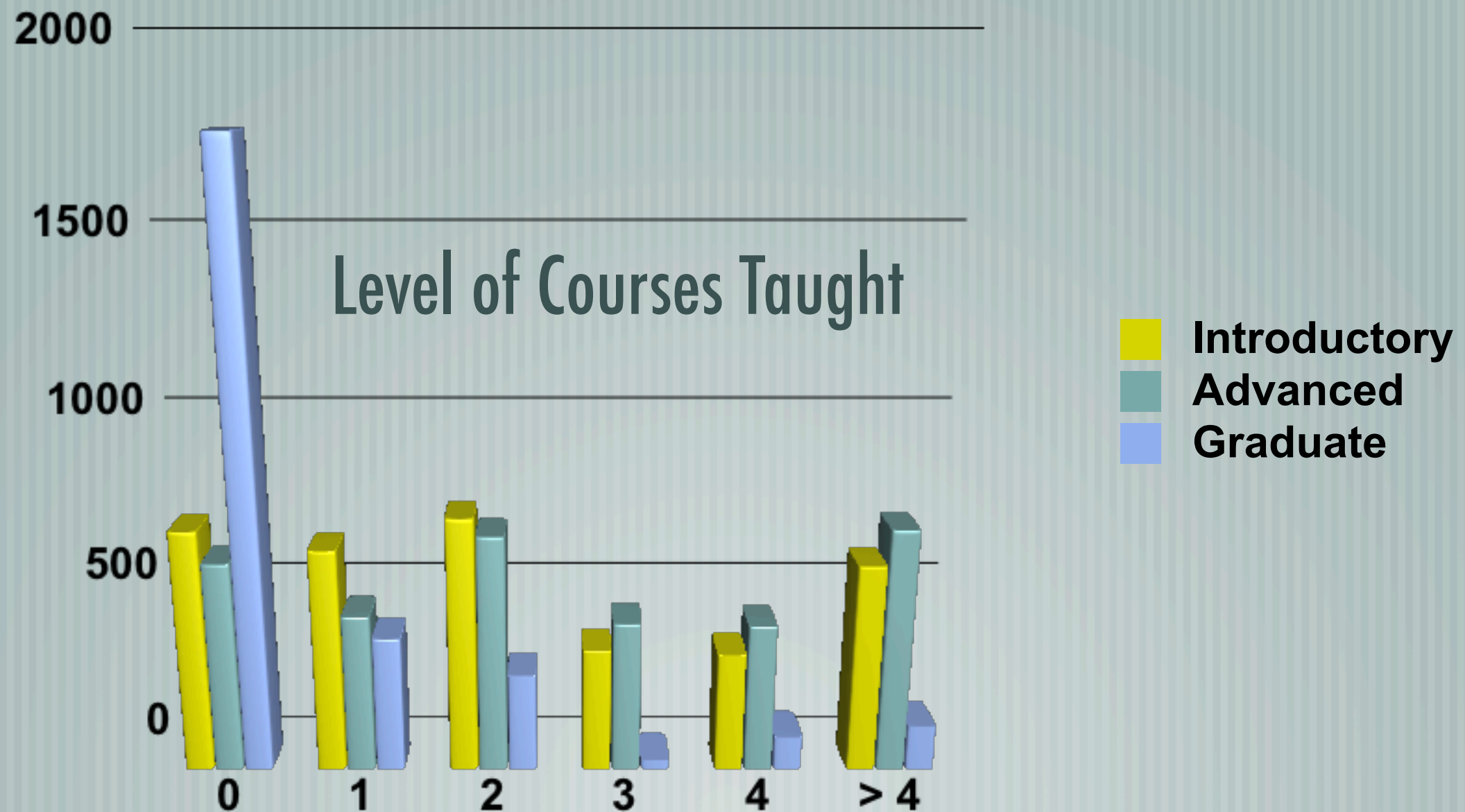
Survey implementation

- Survey sections and questions
  - Designed to parallel themes from focus group
  - Homage to surveys past
- Survey recruitment and delivery
  - Cold e-mailed almost 3000 higher education institutions
  - Approximately 250 responded, and 120 participated
  - Local coordinators managed delivery

Participant Demographics

- 4,678 respondents (4439 who instruct)

- STEM and non-STEM faculty are included

Type of Institution
- Other/NR 4%
- 2 Year 25%
- Doctoral 25%
- Masters 17%
- 4 Year 29%

Faculty Appointment
- Other/NR 7%
- Librarian 3%
- Adjunct 13%
- Instr./Lec. 18%
- Tenured 40%
- Non-Tenured 20%

Participant Demographics, part 2

Participant Demographics, part 3
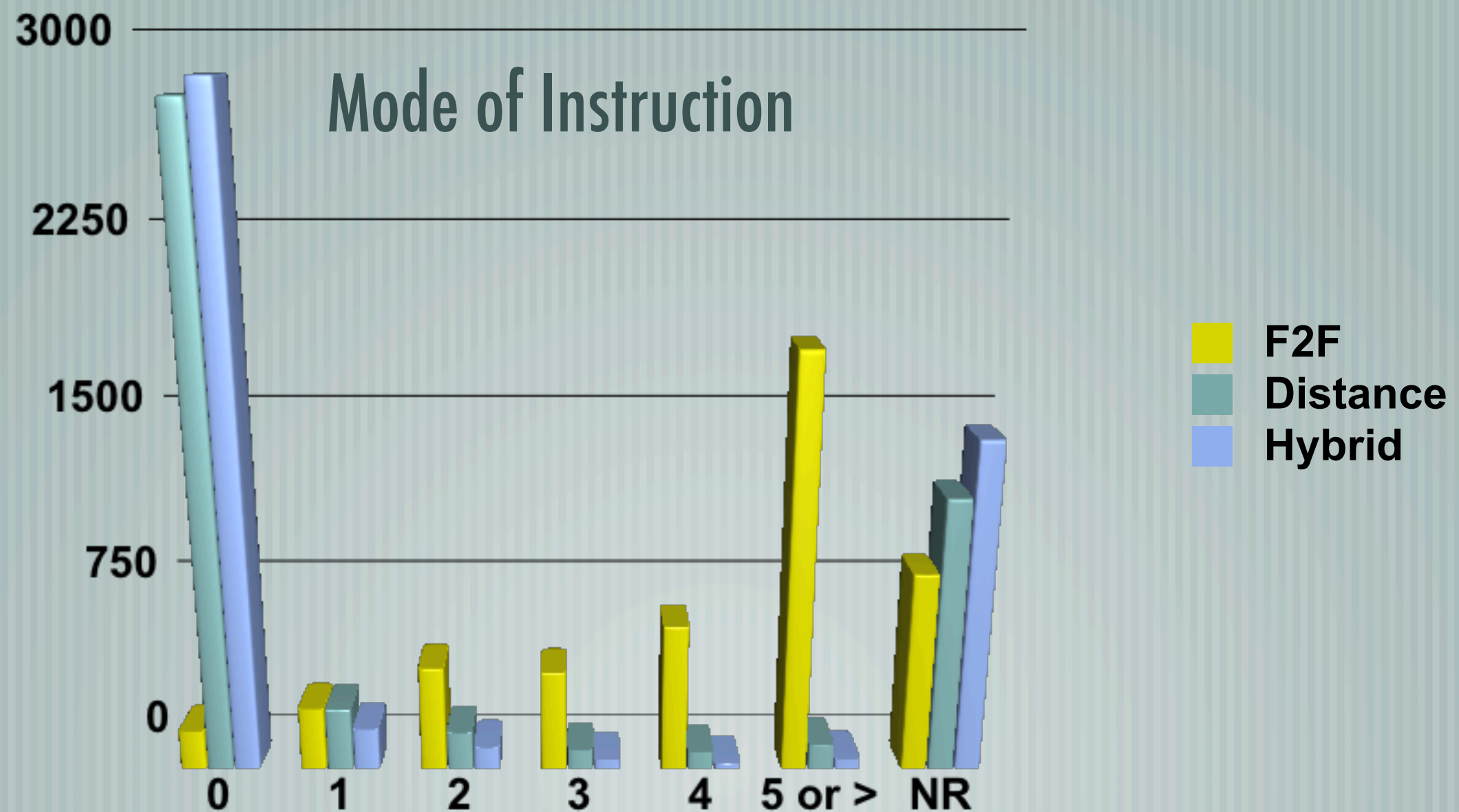
True or False?

- Faculty differ in their use of digital materials based on:

1. Type of institution (community college, teaching institution, research institution)

2. Teaching experience (novice vs. highly experienced)

3. Faculty appointment (adjunct - tenure track - lecturer)

4. Discipline

For each, explain your response

How different are faculty from one another?

- When we look at traditionally identified faculty populations, we see few differences.

    - The type of institution where they serve

    - The amount of time that they have been teaching

    - Even discipline is less a factor than expected

- As far as these traditional groups go, we have a homogenous population based on the factors we examined

- We still believe that there are factors, but they are complex and require further research

Value of Digital Resources

	%
Of great value to my instruction	6 0
Of some value to my instruction	3 4
Of no value to my instructi o n	1
I do not instruct student s	2
No response	3
TOTAL	100

? What's Most Popular ?

Digital Images, Visual Materials, Historical Documents

- Drawings, photographs, video, primary source materials, etc.

Simulations/animations

- Illustrations or programs that present a process or concept that is interactive

Data Sets

- Online educational, business and government datasets, and scientific research databases

Teaching or Learning Activities and Exercises

- Assignments, tutorials, labs, problem sets, etc.

Online Scholarly Resources

- Online journals, scholarly articles discussion groups, etc.

Rank in order of most to least used

What's Most Popular

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How are Resources Used?

1. Presented in Lecture

2. Posted on LMS or course website

3. Used in tests/quizzes

4. Student study aid, for reviews

5. Used in own scholarship

6. PD as teacher

7. Online class discussion

8. Student research or PBL

- Digital Images, Visual Materials, Historical Documents
    Most popular? _____
- Simulations/animations
    Most popular? _____
- Teaching or Learning Activities and Exercises
    Most popular? _____
- Online Scholarly Resources
    Most popular? _____

Types of Digital Resources

Type of Resource	% Use Very Frequently	How Used
Digital images - visual	42	Lecture Prof. Dev. as Teacher Study Aid
Animations	11	Review/Study aid Lecture
Data Sets	22	Prof. Dev. as Teacher Research/PBL
Teaching, Learning Exercises	28	Review/Study aid Lecture
Online scholarly resources	49	Prof. Dev. as Teacher Grants, Scholarship

Source of Digital Resource

	User Created resource	Modified others' resource	Used others' resource as-is
Digital images	- 0.24	- 0.15	0.35
Animations	- 1.12	- 1.01	0.00
Data Sets	- 1.28	- 1.04	0.16
Teaching, Learning Exercises	0.13	- 0.05	0.16
Online scholarly resources	- 1.06	- 0.86	0.68

Values are the mean of participant responses Scale: -2 = very infrequently, +2 = very Frequently.

Why Faculty Are Seeking Digital Resources

Item	Mean (SD) Likelihood of Using Collection of Digital Resources	Mean (SD) Likelihood of Using Web Search Engine (i.e. Google, Yahoo, etc.)
Information that provides students with context for a topic	0.69 (1.49)	1.21 (1.24)
When I want to find examples that get students excited about a topic.	0.43 (1.50)	1.23 (1.23)
When I want to find current information for students.	0.59 (1.53)	1.45 (1.06)
Finding something that illustrates a difficult concept for students.	0.50 (1.51)	0.87 (1.41)
When I want to provide non-technical background for students.	- 0.02 (1.55)	1.06 (1.38)

Scale -2 very unlikely to +2 Very Likely

What Motivates Faculty?

Rank Order	Motivation
	improve students' learning
	stay abreast of professional developments
	helps me keep fresh
	helps students learn difficult concepts
	incorporating DR's in class is fun
	saves me time
	help me better accommodate students w/ disabilities

Motivations for Using Digital Resources

Mean (All)	Motivation
1.28	improve students' learning
1.24	stay abreast of professional developments
1.19	helps me keep fresh
0.92	helps students learn difficult concepts
0.91	incorporating DR's in class is fun
0.80	saves me time
0.02	help me better accommodate students w/ disabilities

Scale: -2 = strongly disagree, +2 = strongly agree (Biologist means are in parentheses)

Learning to Use Digital Resources

How did you learn about incorporating technology into your teaching?

86% self taught (87%)

54% faculty development program (41%)

42% another instructor (38%)

31% other technology instruction/class (19%)

5%   a TA or grad student (7%)

More likely to use collections than search engines to learn about teaching/pedagogy

What are the Barriers?

I would use technology more if.....

+/-	Barrier
	My institution rewarded me for using them
	Technology was more dependable
	More/better training in use of DRs available
	More *Useful* DR were available
	Had more time
	Had more access to technology
	Greater priority in my institution

Scale -2 = strongly disagree, +2 = strongly agree

Barriers to Using Digital Resources

I would use technology more if.....

Mean	Barrier
0.94	Had more time
0.45	More *Useful* DR were available
0.42	More/better training in use of DRs available
0.05	My institution rewarded me for using them
- 0.07	Technology was more dependable
- 0.07	Had more access to technology
- 0.37	Greater priority in my institution

Scale -2 = strongly disagree, +2= strongly agree

Time

Time is not a barrier . . . really!

Everyone has to make decisions about spending time and perform a cost/benefit analysis.

When someone says, "I don't have time," it means, "In my priorities, this is lower in rank or it is not worth the cost."

What is higher priority and what can be done to reduce barriers

Go, Yield, Stop

		Rewards		
		Rewarded	Unrewarded	Discouraged
Work Practice	Easy			
Work Practice	Difficult			

Confounding factors

Barriers require activation energy to be overcome

Intrinsic motivation is a powerful force (but not a limitless reservoir)

Tradition is yet another powerful driver (change is hard)

Students can be another powerful extrinsic motivator

All work practices are different

Never underestimate the willingness of a motivated individual to ignore you.

Importance of DL Features

Content	Pedagogy
42% peer reviewed & of high quality	12% supplemented w/ materials to explain use in teaching
41% organized to find quickly	5% supplemented w/ materials to use in Prof. Development

Percentage of respondents who ranked this as most important

Conclusions

— Faculty are more alike than different in use of online digital materials

— Individuals who stated they valued DRs used them more often within classes (e.g. images)

— Still there are vast differences in usage between classes (Images vs. animations)

— Faculty prefer search for finding materials

— Barriers to use cannot be simply described

Meeting Users Halfway

Faculty developers

- Do your faculty know about available resources?

- Offer support for the use of these resources.

Content providers

- What resources are your users seeking (both content and granularity)?

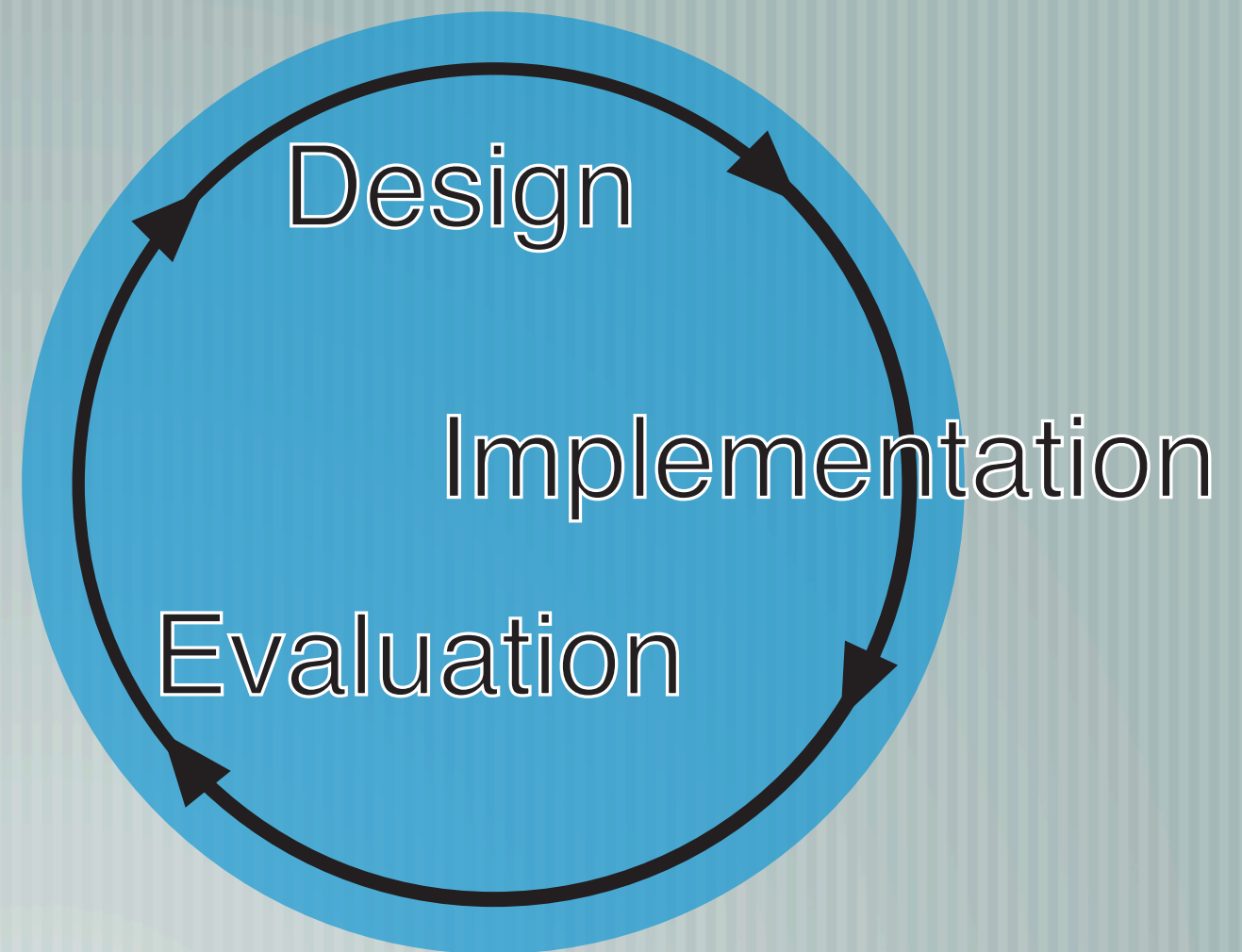- Offer materials to assist users and faculty developers.

Course design cycle

General course instructional design model

Where is this used?

 Professional designed

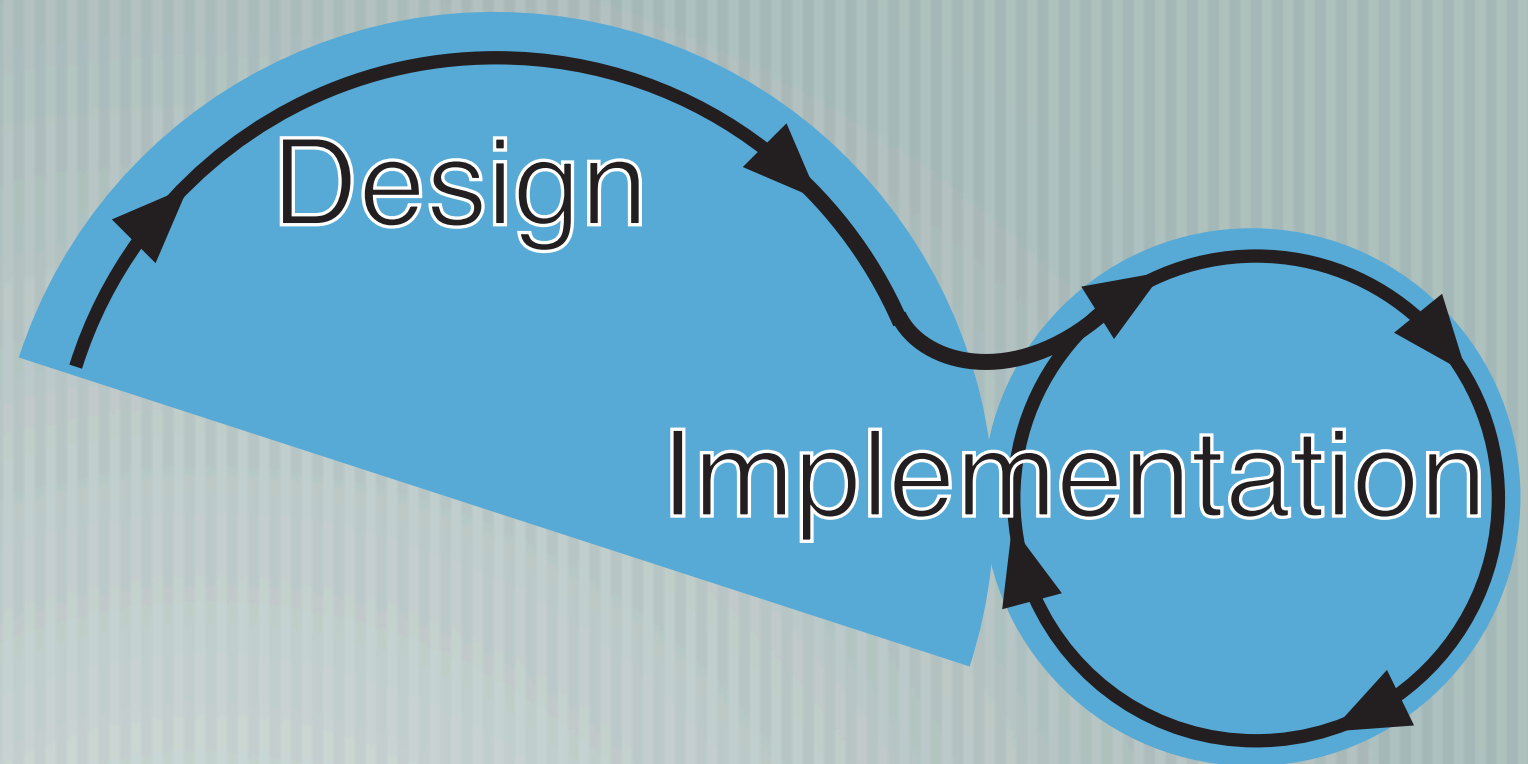 Complete redesign

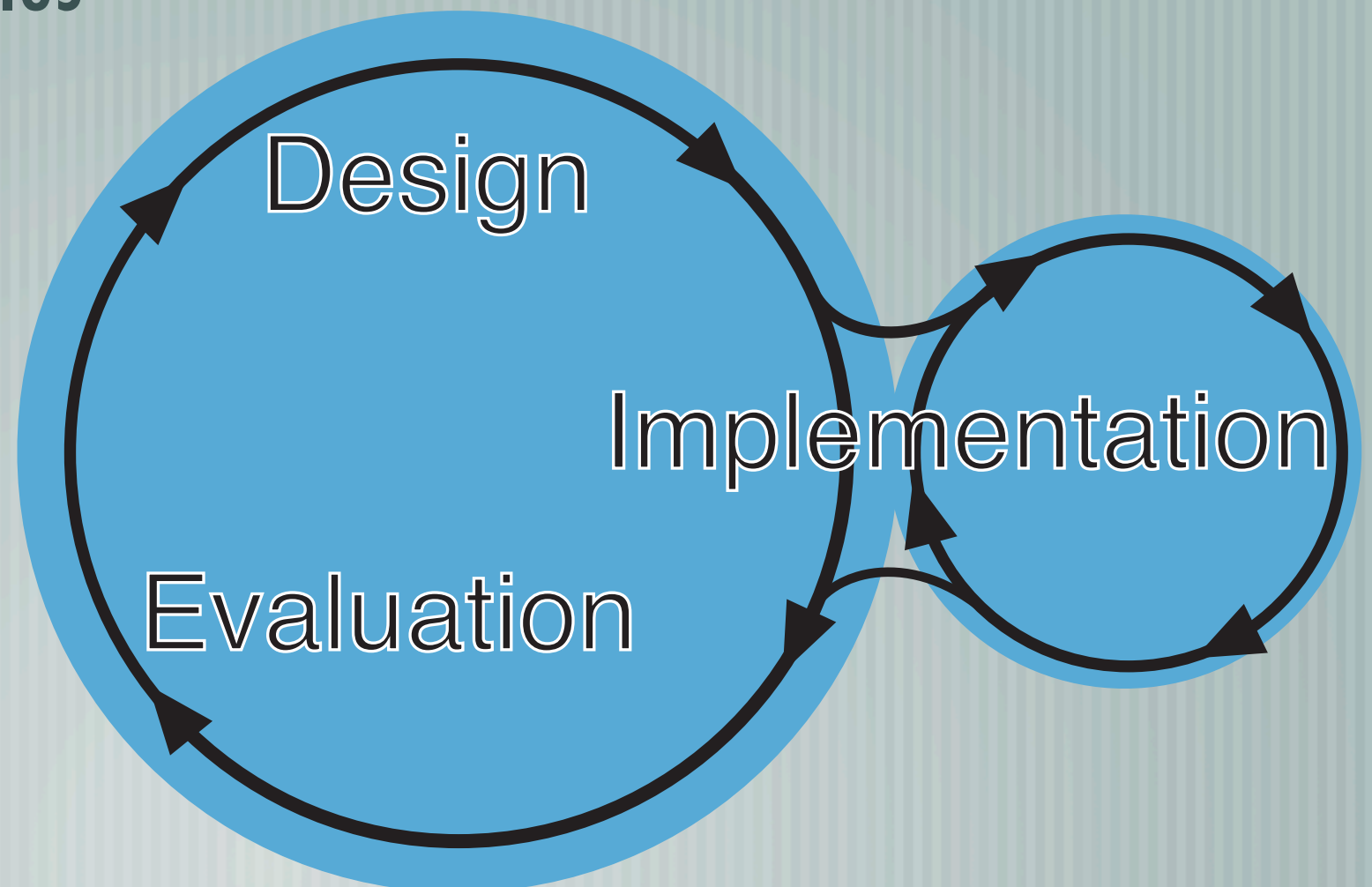Expensive both in $$ and instructor time

Design

Implementation

Evaluation

Reimplementation

- Personal observation

- Design once, make small incremental changes

- Efficient for instructor

Design

Implementation

Combination

Cycle through traditional and reimplementation cycles

Balances cost and efficiency

I've talked too long...

What do you see:

Where are your faculty

How do you support what they want to do?

How do you advance what they do?