Improving Courses Across an Online Program: A Design-Based Approach

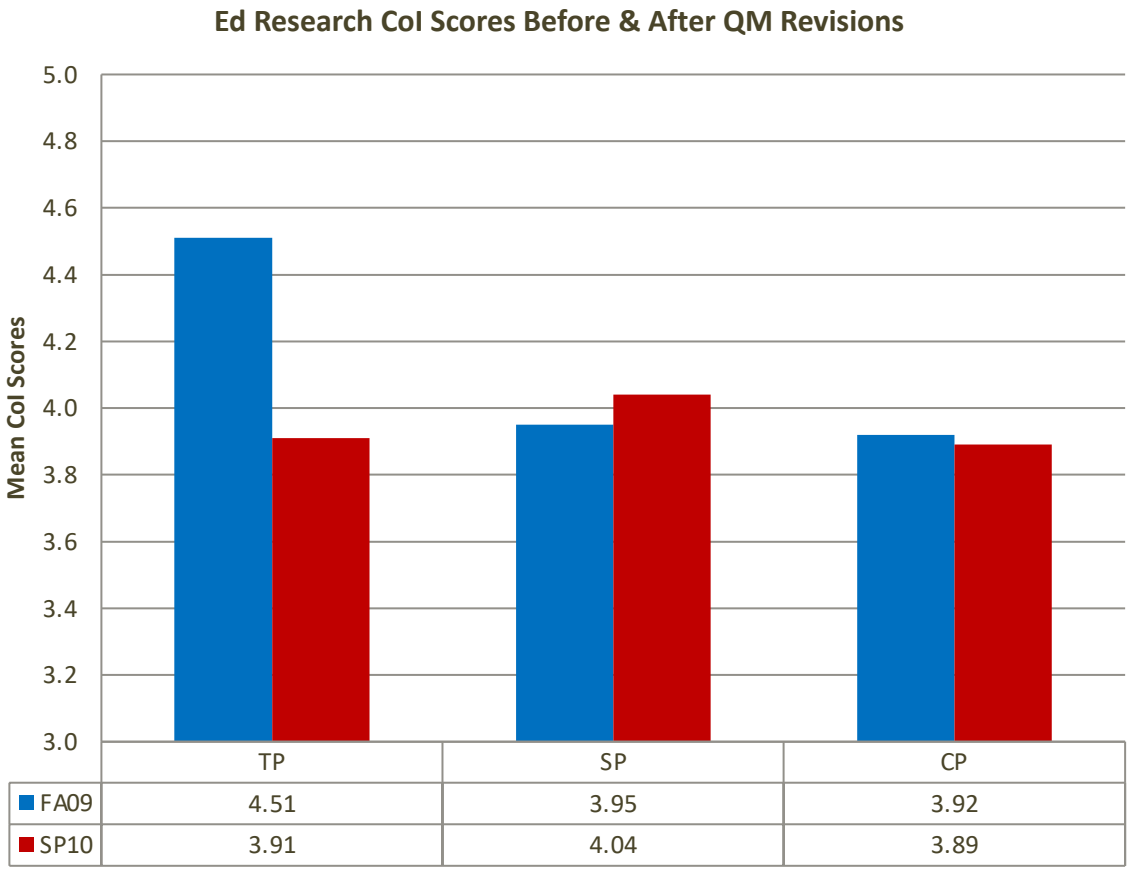
Leonard Bogle, Scott Day, Daniel Matthews & Karen Swan
University of Illinois Springfield

Initial Study

Can course redesign based on meeting Quality Matters standards improve learning processes as measured by the Community of Inquiry survey?

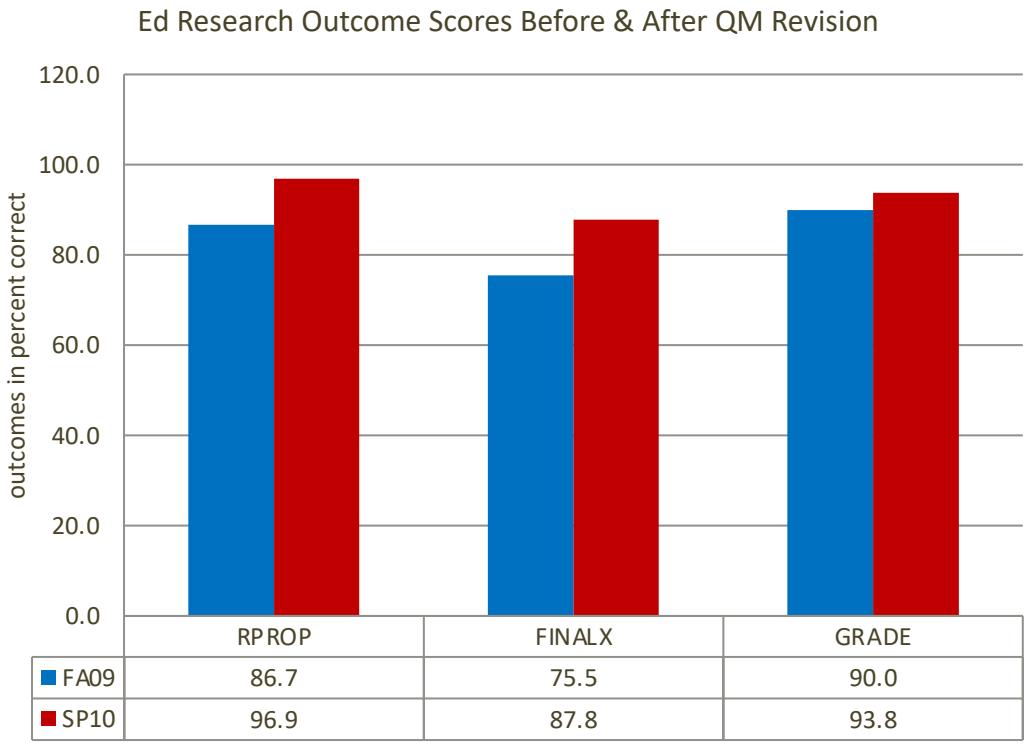
Can improved learning processes lead to improved student performance and perceived learning?

CoI Survey Results



	TP	SP	CP
FA09	4.51	3.95	3.92
SP10	3.91	4.04	3.89

Student Performance



Initial Study

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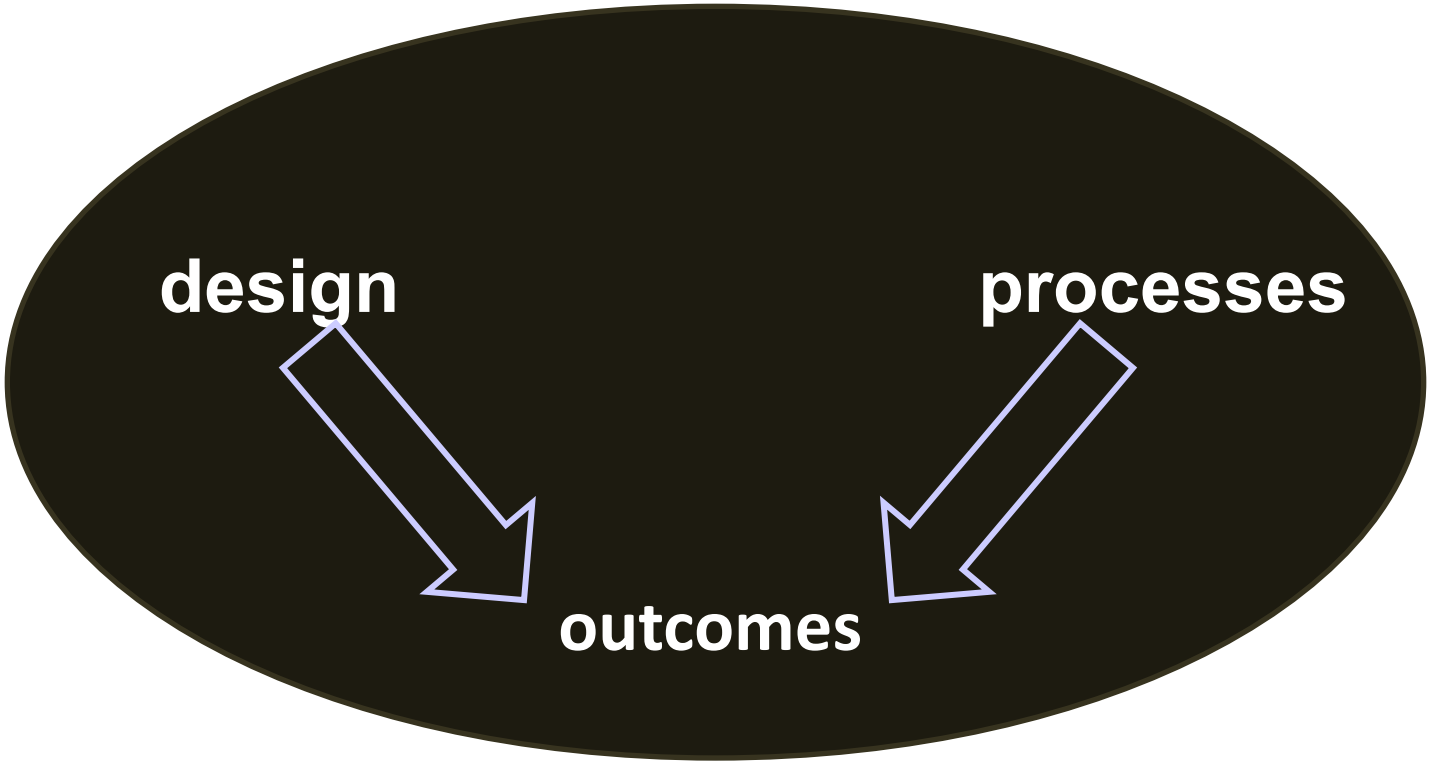


Design Experiment

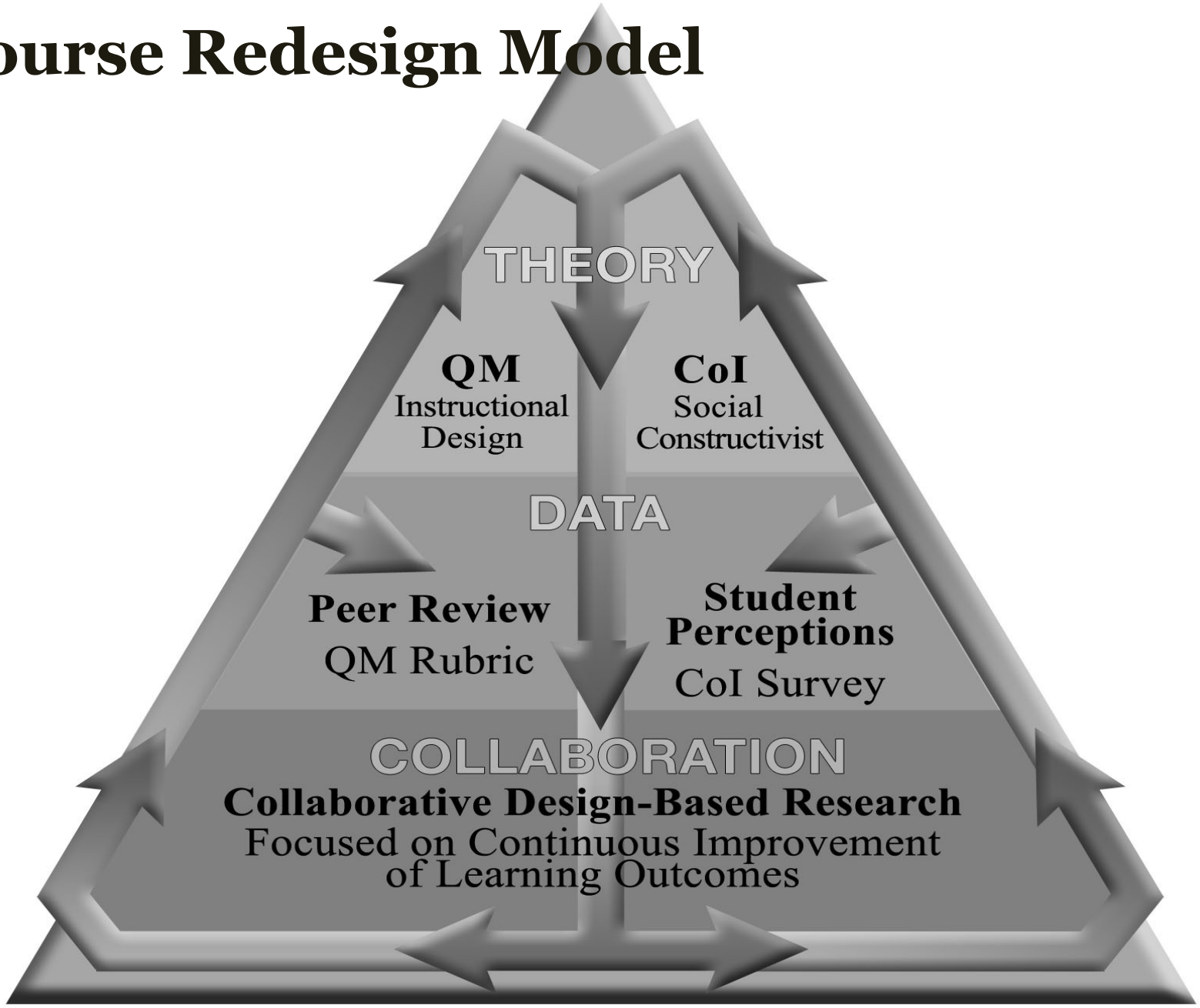
- blends empirical research with the theory-based design of learning environments
- systematic investigation of innovations designed to improve educational practice through an iterative process of design, development, implementation & analysis in real-world settings (Wang & Hannafin, 2005)

Design-based research is characterized by:

- Situated in a real educational context
- Focused on design & testing of significant intervention
- Employs mixed methods
- Involves multiple interventions
- Collaborative partnership between researchers & practitioners
- Evolution of design principles

(Anderson & Shattuck, 2012)

Course Redesign Model



Quality Matters Framework

- an input model of learning in online and blended educational environments
- grounded in an instructional design view of higher education
- assumes effective learning in higher education flows from well-specified outcomes/objectives/assessments

Quality Matters Rubric

- review by three peers
- 41 criteria in 8 categories (course overview, learning objectives, assessment, materials, interactivity, technology learner support, accessibility) that are either met or not
- 21 (3 point) criteria must be met + point threshold (cumulative)

Quality Matters Rubric

Course Overview and Introduction	1.1 Instructions make clear how to get started and where to find various course components.	3
	1.2 A statement introduces the student to the purpose of the course and to its components; in the case of a hybrid course, the statement clarifies the relationship between the face-to-face and online components.	3
	1.3 Etiquette expectations (sometimes called "netiquette" for online discussions, email, and other forms of communication are stated clearly.	1
	1.4 The self-introduction by the instructor is appropriate and available online.	1
	1.5 Students are asked to introduce themselves to the class.	1
	1.6 Minimum student preparation, and, if applicable, prerequisite knowledge in the discipline are clearly stated.	1
	1.7 Minimum technical skills expected of the student are clearly stated.	1
Learning Objectives	2.1 The course learning objectives describe outcomes that are measurable.	3
	2.2 The module/unit learning objectives describe outcomes that are measurable and consistent with the course-level objectives.	3
	2.3 All learning objectives are stated clearly and written from the students' perspective.	3
	2.4 Instructions to students on how to meet the learning objectives are adequate and stated clearly.	3
	2.5 The learning objectives are appropriately designed for the level of the course.	2

Quality Matters Rubric

Assessment and Measurement	3.1 The types of assessments selected measure the stated learning objectives and are consistent with course activities and resources.	3
	3.2 The course grading policy is stated clearly.	3
	3.3 Specific and descriptive criteria are provided for the evaluation of students' work and participation.	3
	3.4 The assessment instruments selected are sequenced, varied, and appropriate to the content being assessed.	2
	3.5 "Self-check" or practice assignments are provided, with timely feedback to students.	2
Resources and Materials	4.1 The instructional materials contribute to the achievement of the stated course and module/unit learning objectives.	3
	4.2 The relationship between the instructional materials and the learning activities is clearly explained to the student.	3
	4.3 The instructional materials have sufficient breadth, depth, and currency for the student to learn the subject.	2
	4.4. All resources and materials used in the course are appropriately cited.	1

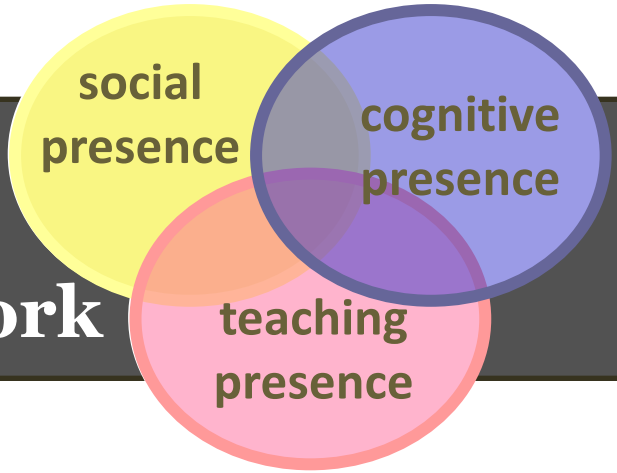
Quality Matters Rubric

Learner Engagement	5.1 The learning activities promote the achievement of the stated learning objectives.	3
	5.2 Learning activities foster instructor-student, content-student, and if appropriate to the course, student-student interaction.	3
	5.3 Clear standards are set for instructor responsiveness and availability (turn-around time for email, grade posting, etc.)	2
	5.4 The requirements for student interaction are clearly articulated.	2
Course Technology	6.1 The tools and media support the learning objectives, and are appropriately chosen to deliver the content of the course.	3
	6.2 The tools and media support student engagement and guide the student to become an active learner.	3
	6.3 Navigation throughout the online components of the course is logical, consistent, and efficient.	3
	6.4 Students have ready access to the technologies required in the course.	2
	6.5 The course components are compatible with current standards for delivery modes.	1
	6.6 Instructions on how to access resources at a distance are sufficient and easy to understand.	1
	6.7 The course design takes full advantage of available tools and media.	1

Quality Matters Rubric

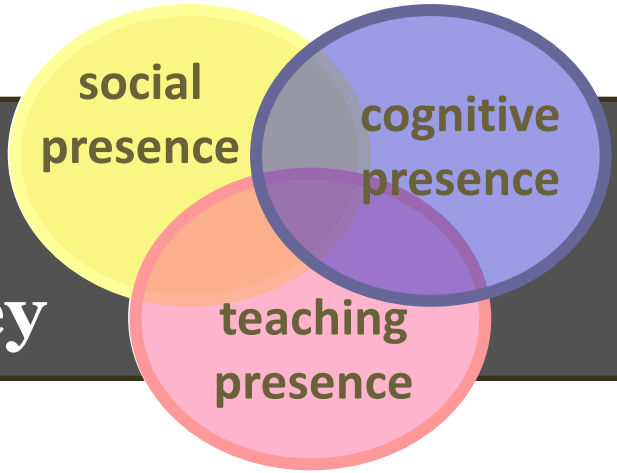
Learner Support	7.1 The course instructions articulate or link to clear description of the technical support offered.	2
	7.2 Course instructions articulate or link to an explanation of how the institution's academic support system can assist the student in effectively using the resources provided.	2
	7.3 Course instructions articulate or link to an explanation of how the institution's student support services can help students reach their educational goals.	1
	7.4 Course instructions answer basic questions related to research, writing, technology, etc., or link to tutorials or other resources that provide the information.	1
Accessibility	8.1 The course incorporates ADA standards and reflect conformance with institutional policy regarding accessibility in online and hybrid courses.	3
	8.2 Course pages and course materials provide equivalent alternatives to auditory and visual content.	2
	8.3 Course pages have links that are self-describing and meaningful.	2
	8.4 The course ensures screen readability.	1

Community of Inquiry Framework



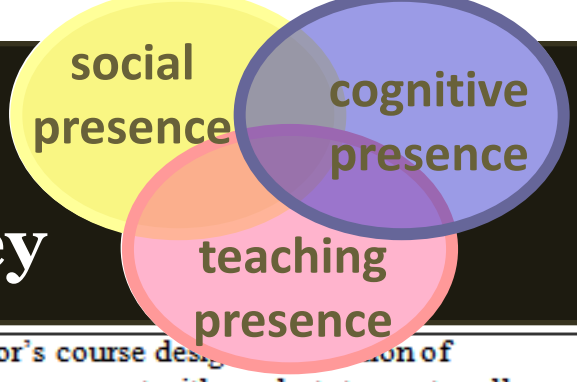
- a process model of learning in online and blended educational environments
- grounded in a social constructivist view of higher education
- assumes effective learning in higher education requires the development of a community of learners that supports meaningful inquiry

Community of Inquiry Survey



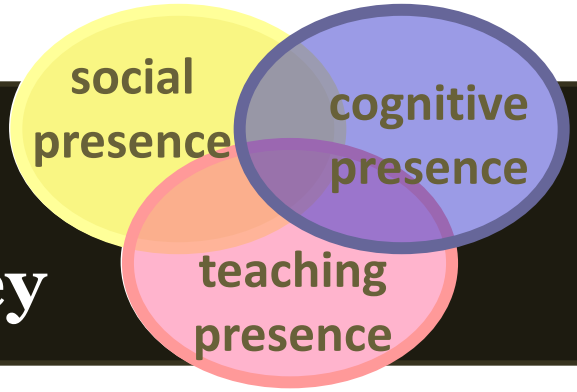
- 34 items – 13 teaching presence (TP), 9 social presence (SP) & 12 cognitive presence (CP)
- statements for which students indicate agreement/ disagreement on a five point Likert scale (1=strongly disagree to 5=strongly agree)
- at least 3 items for each element of each presence

Community of Inquiry Survey



The following statements relate to your perceptions of "**Teaching Presence**" -- your instructor's course des[illegible]on of discussion, and direct instruction -- in this course. Please indicate both your agreement or disagreement with each statement and how important you think it is.

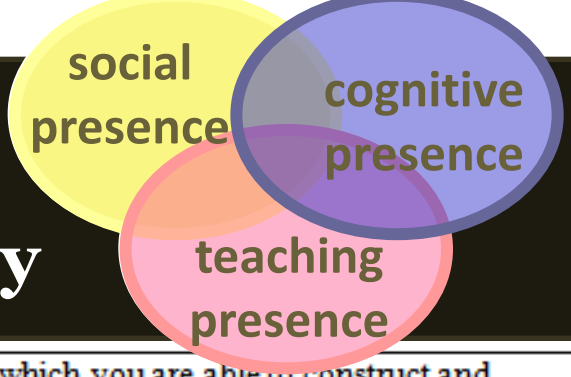
#	Statement	Agreement 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree				
1	The instructor clearly communicated important course topics.	1	2	3	4	5
2	The instructor clearly communicated important course goals.	1	2	3	4	5
3	The instructor provided clear instructions on how to participate in course learning activities	1	2	3	4	5
4	The instructor clearly communicated important due dates/time frames for learning activities.	1	2	3	4	5
5	The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	1	2	3	4	5
6	The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.	1	2	3	4	5
7	The instructor helped to keep course participants engaged and participating in productive dialogue.	1	2	3	4	5
8	The instructor helped keep the course participants on task in a way that helped me to learn.	1	2	3	4	5
9	The instructor encouraged course participants to explore new concepts in this course.	1	2	3	4	5
10	Instructor actions reinforced the development of a sense of community among course participants	1	2	3	4	5
11	The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	1	2	3	4	5
12	The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.	1	2	3	4	5
13	The instructor provided feedback in a timely fashion.	1	2	3	4	5



Community of Inquiry Survey

The following statements refer to your perceptions of "**Social Presence**" -- the degree to which you feel socially and emotionally connected with others -- in your course. Please indicate both your agreement or disagreement with each statement and how important you think it is.

#	Statement	Agreement 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree				
14	Getting to know other course participants gave me a sense of belonging in the course.	1	2	3	4	5
15	I was able to form distinct impressions of some course participants.	1	2	3	4	5
16	Online or web-based communication is an excellent medium for social interaction.	1	2	3	4	5
17	I felt comfortable conversing through the online medium.	1	2	3	4	5
18	I felt comfortable participating in the course discussions.	1	2	3	4	5
19	I felt comfortable interacting with other course participants.	1	2	3	4	5
20	I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	1	2	3	4	5
21	I felt that my point of view was acknowledged by other course participants.	1	2	3	4	5
22	Online discussions help me to develop a sense of collaboration.	1	2	3	4	5



Community of Inquiry Survey

The following statements relate to your perceptions of "**Cognitive Presence**" -- the extent to which you are able to construct and confirm meaning – in this course. Please indicate both your agreement or disagreement with each statement and how important you think it is.

#	Statement	Agreement 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree				
23	Problems posed increased my interest in course issues.	1	2	3	4	5
24	Course activities piqued my curiosity.	1	2	3	4	5
25	I felt motivated to explore content related questions.	1	2	3	4	5
26	I utilized a variety of information sources to explore problems posed in this course.	1	2	3	4	5
27	Brainstorming and finding relevant information helped me resolve content related questions.	1	2	3	4	5
28	Discussing course content with my classmates was valuable in helping me appreciate different perspectives.	1	2	3	4	5
29	Combining new information helped me answer questions raised in course activities.	1	2	3	4	5
30	Learning activities helped me construct explanations/solutions.	1	2	3	4	5
31	Reflection on course content and discussions helped me understand fundamental concepts in this class.	1	2	3	4	5
32	I can describe ways to test and apply the knowledge created in this course.	1	2	3	4	5
33	I have developed solutions to course problems that can be applied in practice.	1	2	3	4	5
34	I can apply the knowledge created in this course to my work or other non-class related activities.	1	2	3	4	5

CoI "tweaking": Teacher Leadership

Open-ended comments suggest that first assignment needs more scaffolding and more time for students to learn PDSA technique

Response:

- break first large PDSA assignment into three separate assignments spread across three weeks

CoI "tweaking": Curriculum & Assessment

Lowest ratings on FA 11 CoI survey were 4 **SP** items (2 **affective expression** & 2 **group cohesion**) below 3.75

Response:

- more whole group activities designed to help students get to know each other;
- "question of the week" discussion added to offer additional collaboration opportunities;
- more group activities developed

CoI "tweaking": Educational Research A

Lowest ratings on FA 11 CoI survey were 4 **SP** items (2 **affective expression** & 2 **group cohesion**) and 3 **TP** items (all **facilitation of discussion**) below 3.75

Response:

- instructor more visible to students through twice a week postings to discussion board;
- instructions to article & proposal leaders changed to include participation directions as well

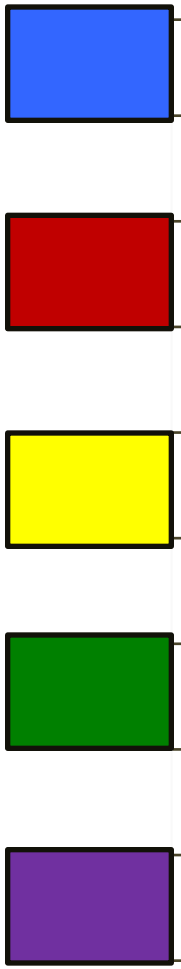
CoI "tweaking": Educational Research B

Lowest ratings on SP 10 – FA 10 CoI surveys seemed centered on online discussion and collaborative learning group work

Response:

- changed discussion grading from extra-credit to 2 credits per discussion (x8 discussions);
- added negotiated contract to group work;
- changed discussion topics from problem-based to value-based

initial QM revision & iterative CoI "tweaking"



baseline collect CoI survey & outcomes data

QM review & revisions

post QM collect CoI survey & outcomes data

CoI analysis & revisions

CoI 1 collect CoI survey & outcomes data

CoI analysis & revisions

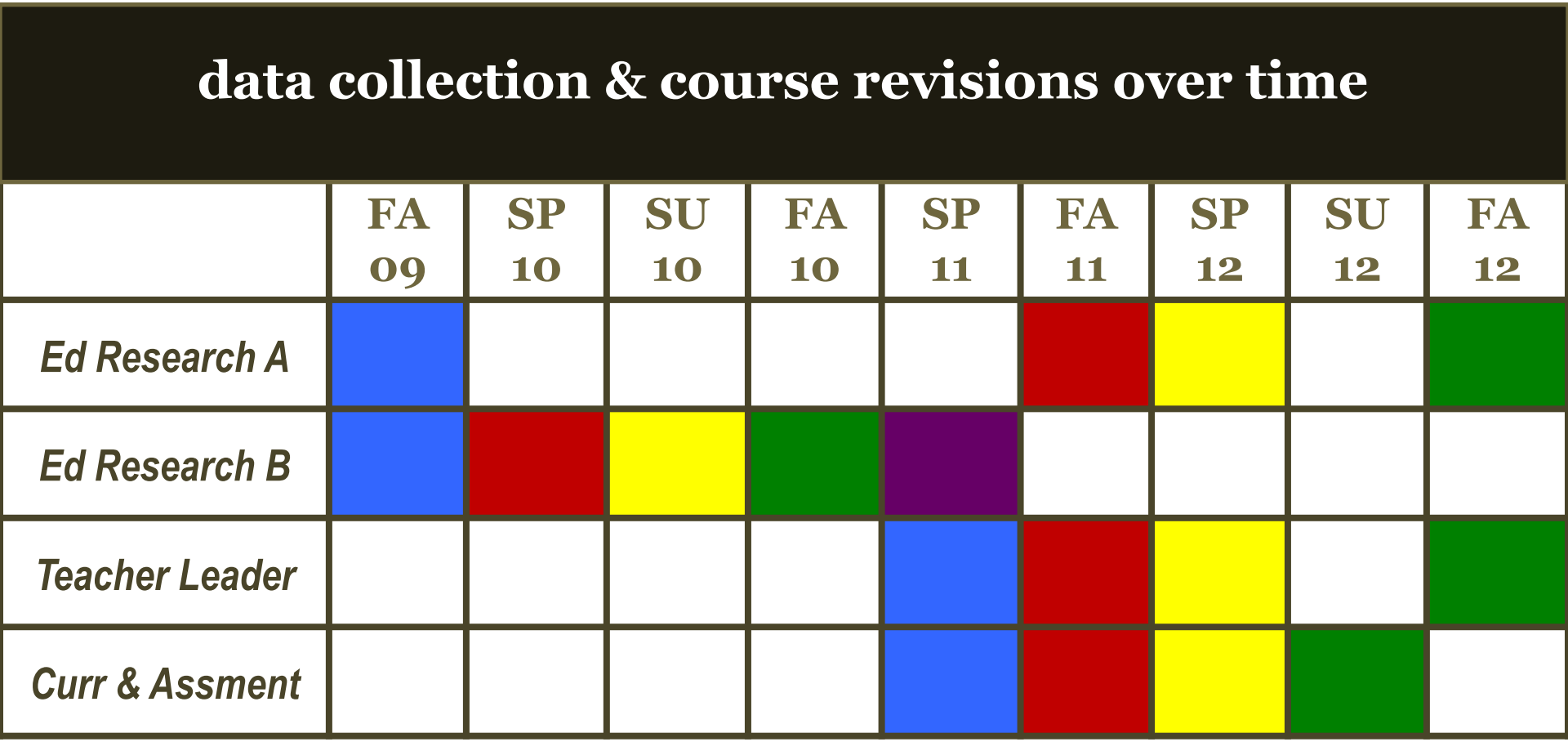
CoI 2 collect CoI survey & outcomes data

CoI analysis & revisions

CoI 3 Collect CoI survey & outcomes data

…

data collection & course revisions over time



Design Experiment

Can course redesign based on meeting Quality Matters standards (QM revisions) result in improved student learning outcomes?

Can changes in course design and implementation targeted to enhance particular Community of Inquiry scores (CoI revisions) lead to both increased CoI scores and improved learning outcomes?

What is the effect of the two-phased combination of QM revisions & CoI revisions on student learning outcomes?

Methodology

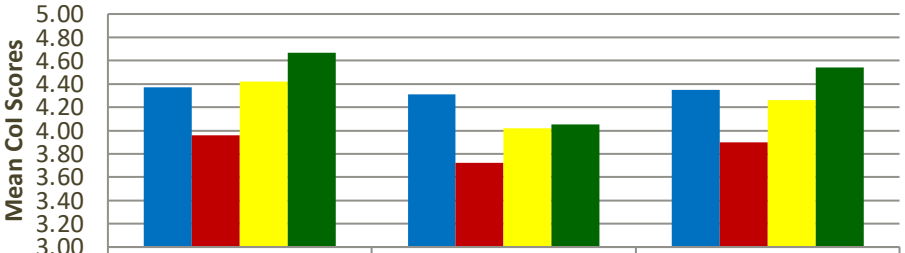
subjects – graduate students enrolled in EDL core courses (n=214/288=74% response rate)

instruments – QM review & CoI survey

outcome measures – standardized scores (percent correct) on major course assignments and overall course grades

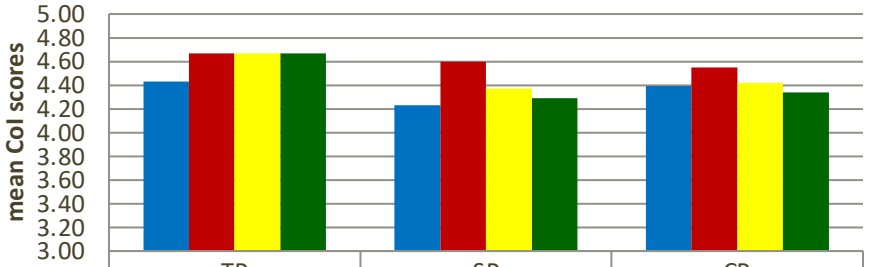
Results: CoI Survey (n=214/288=74%)

Curriculum & Assessment CoI scores across 4 semesters



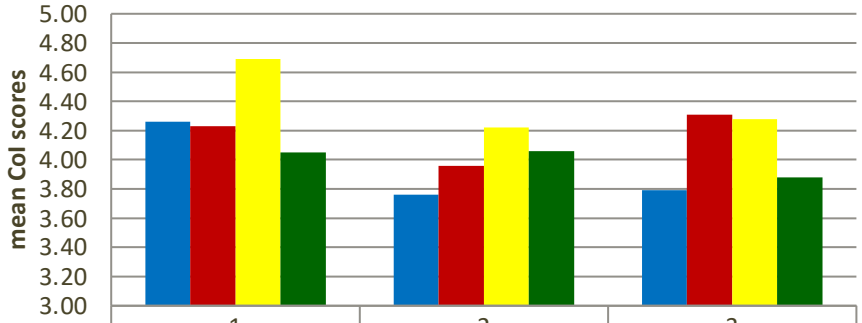
	TP	SP	CP
SP11	4.37	4.31	4.35
FA11	3.96	3.72	3.90
SP12	4.42	4.02	4.26
SU12	4.67	4.05	4.54

Teacher Leadership CoI scores across 4 semesters



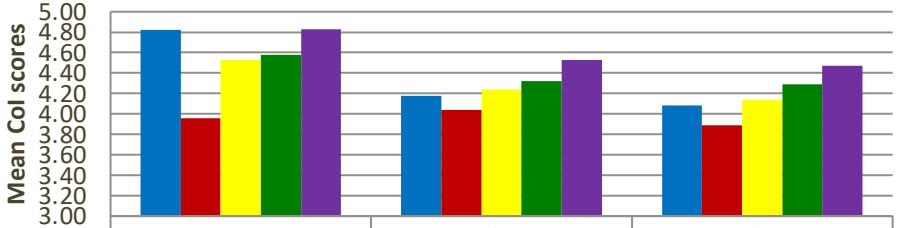
	TP	SP	CP
SP11	4.43	4.23	4.39
FA11	4.67	4.60	4.55
SP12	4.67	4.37	4.42
FA12	4.67	4.29	4.34

Educational Research A CoI scores across 4 semesters



	1	2	3
FA09	4.26	3.76	3.79
FA11	4.23	3.96	4.31
SP12	4.69	4.22	4.28
FA12	4.05	4.06	3.88

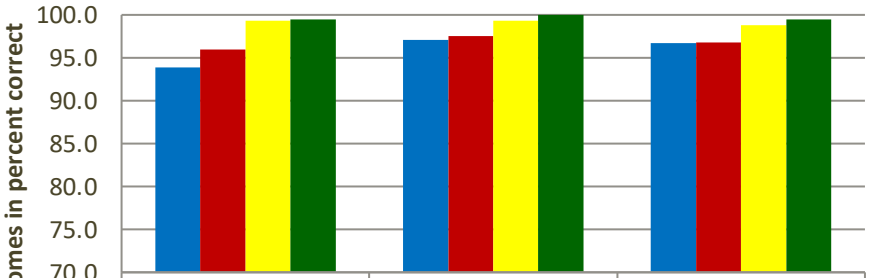
Educational Research B CoI Scores Across 5 Semesters



	TP	SP	CP
FA09	4.82	4.18	4.08
SP10	3.96	4.04	3.89
SU10	4.53	4.24	4.14
FA10	4.58	4.32	4.29
SP11	4.83	4.53	4.47

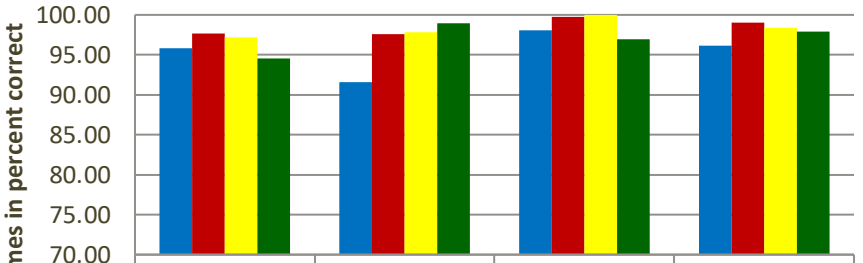
Results: Outcomes (n=214/288=74%)

Curriculum & Assessment outcomes scores across 4 semesters



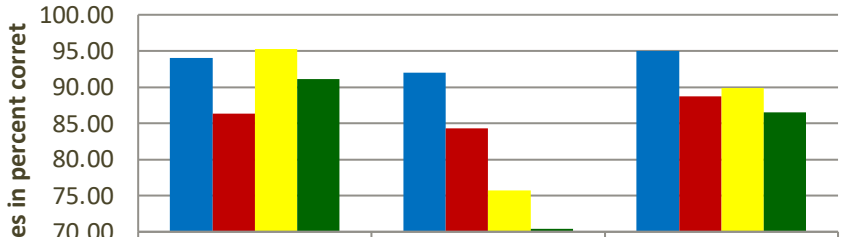
	P1	P2	GRADE
SP11	93.9	97.1	96.7
FA11	96.0	97.5	96.8
SP12	99.3	99.3	98.8
SU12	99.5	100.0	99.5

Teacher Leadership outcome scores across 4 semesters



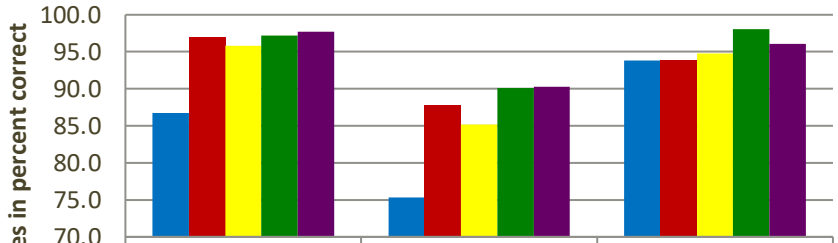
	P1	P2	REFLECT	GRADE
SP11	95.82	91.60	98.04	96.16
FA11	97.63	97.56	99.77	99.04
SP12	97.19	97.82	100.00	98.36
FA12	94.55	98.92	96.92	97.92

Educational Research A outcomes across 4 semesters



	RPROP	FINALX	GRADE
FA09	94.00	92.00	95.00
FA11	86.30	84.30	88.70
SP12	95.24	75.71	89.83
FA12	91.13	70.38	86.50

Educational Research B outcomes across 5 semesters



	RPROP	FINALX	GRADE
FA09	86.7	75.3	93.8
SP10	96.9	87.8	93.8
SU10	95.8	85.2	94.8
FA10	97.2	90.1	98.1
SP11	97.7	90.3	96.1

Conclusions

- Combination of QM & CoI revisions can result in improvements in student learning
- We believe this model can be adapted for use in other programs and/or disciplines using a two-phase process:
  - (QM) adjustments for course design
  - the use of analytics (CoI) to iteratively improve course implementation

Conclusions

Implications for Practice

- Assure a **collaborative, collegial process** by including willing stakeholders in an ongoing, iterative cycle.
- Assure **design quality** by collaboratively choosing a common measure and applying it in an open environment of collaboration and trust.
- Assure **implementation quality** by collaboratively choosing a way to assess learning processes and applying it in a design-based, iterative manner.
- Revisit **desired outcomes** (match outcomes measures to them, then match design and implementation to desired outcomes -- backwards design)

Questions/Comments?

lbogl1@uis.edu
sday1@uis.edu
dmatt1@uis.edu
kswan4@uis.edu

Department of Educational Leadership
University of Illinois Springfield