Welcome to your Summer 2018 CIRTL Network Short Course

Designing Your Course & Designing Yourself As a Teacher: A Simultaneous Process

Brought to you by instructors from the University of North Carolina at Chapel Hill, a CIRTL Member

Thursdays in July
2:00-4:00PM ET / 1:00-3:00PM CT / **12:00-2:00PM MT** / 11:00-1:00PM PT

When you join the room, please:

1. Download “Week 4 Slides: Instructional Improvement” from Moodle ( )
and use the polling tool  to let us know when you’ve done so.

2. Confirm that your microphone and headphones work by running the Audio Setup Wizard:
Tools Menu → Audio → Audio Setup Wizard. If you run into issues, type a message in the chat window.

Honing your craft: Building a foundation for a lifetime of instructional improvement

Brian A. Couch

University of Nebraska
School of Biological Sciences

bcouch2@unl.edu

Univ. North Carolina
Jul 26, 2018

My path to discipline-based education research

Regis University (B.S.)
Biology

Yale University (Ph.D.)
Biochemistry

My path to discipline-based education research

Regis University (B.S.)
Biology

Yale University (Ph.D.)
Biochemistry

University of Colorado (Postdoc.)
Biology Education Research

My path to discipline-based education research

Regis University (B.S.)
Biology

Yale University (Ph.D.)
Biochemistry

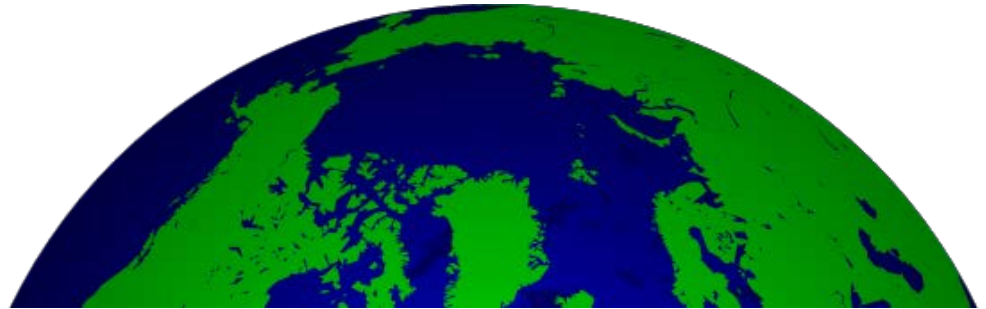
University of Colorado (Postdoc.)
Biology Education Research

University of Nebraska (Asst. Prof.)
Biology Education Research

Workshop overview

1. **Collecting and leveraging evidence for instructional improvement**
   - Conducting informed reflection
   - Documenting teaching practices

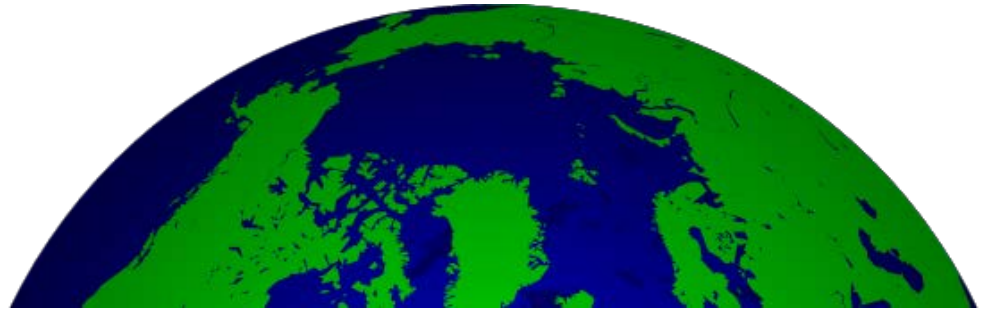
2. **Designing a teaching-as-research project**
   - Elements of research design
   - Example of course-based research



Workshop overview

1. **Collecting and leveraging evidence for instructional improvement**
   - Conducting informed reflection
   - Documenting teaching practices

2. **Designing a teaching-as-research project**
   - Elements of research design
   - Example of course-based research



How does teaching experience affect student learning?

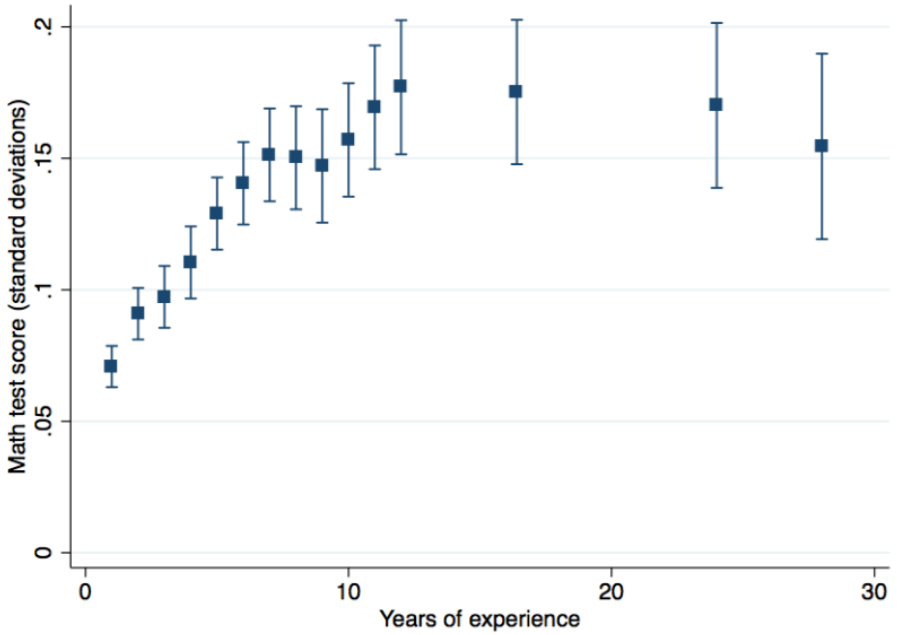
National Center for Analysis of Longitudinal Data in Education Research (2015)

How does teaching experience affect student learning?

What implications does this graph have for how we approach teaching as a professional practice?

National Center for Analysis of Longitudinal Data in Education Research (2015)

What implications does this graph have for how we approach teaching as a professional practice?



Share on this slide by clicking the  *icon in the vertical toolbar to the left, creating a text box, and typing.*

Thinking about the goals of undergraduate courses

What does it mean for you to be an effective instructor? What are the outcomes that you want your students to achieve?

Share on this slide by clicking the  *icon in the vertical toolbar to the left, creating a text box, and typing.*

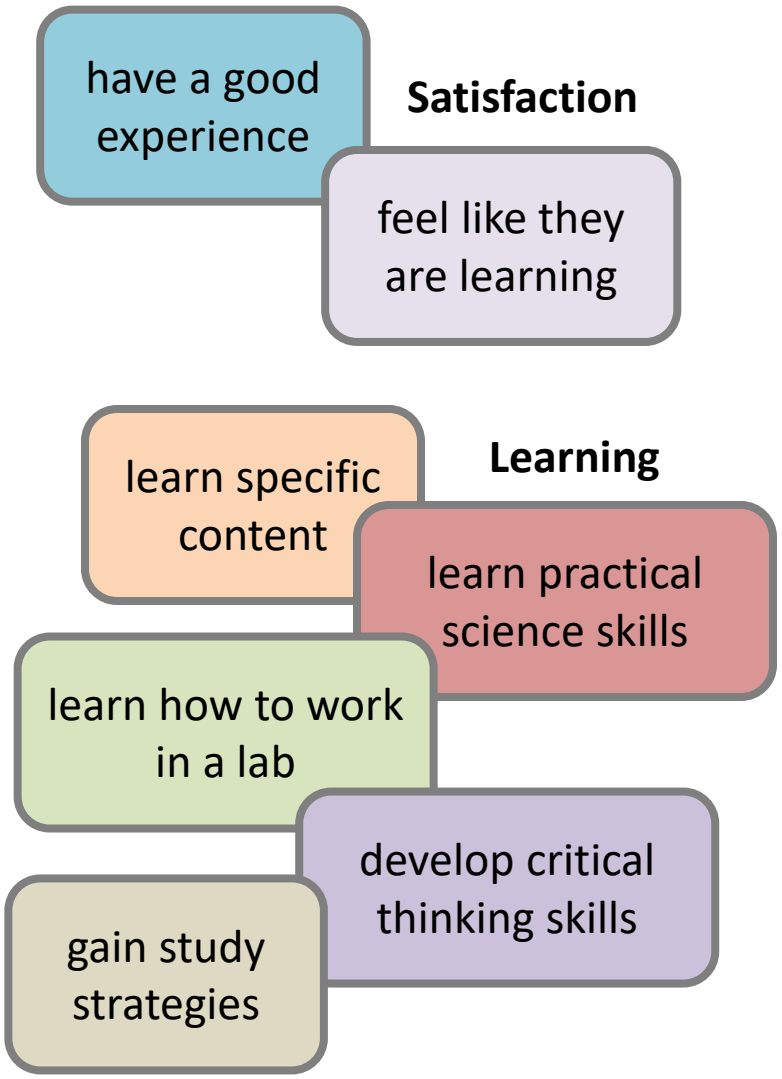
CIRTL

Some desired outcomes of undergraduate courses

I want students to:

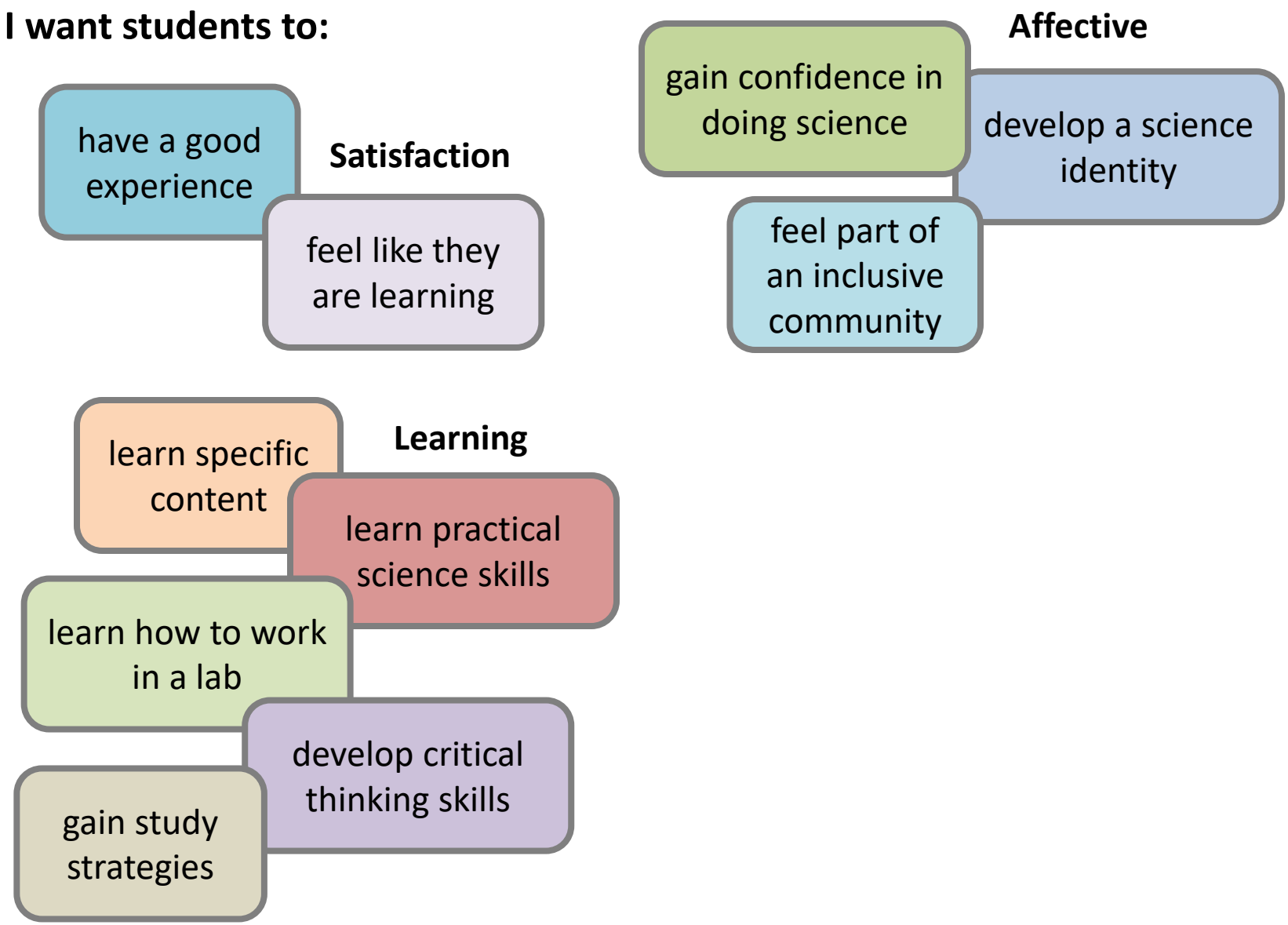
Some desired outcomes of undergraduate courses

I want students to:

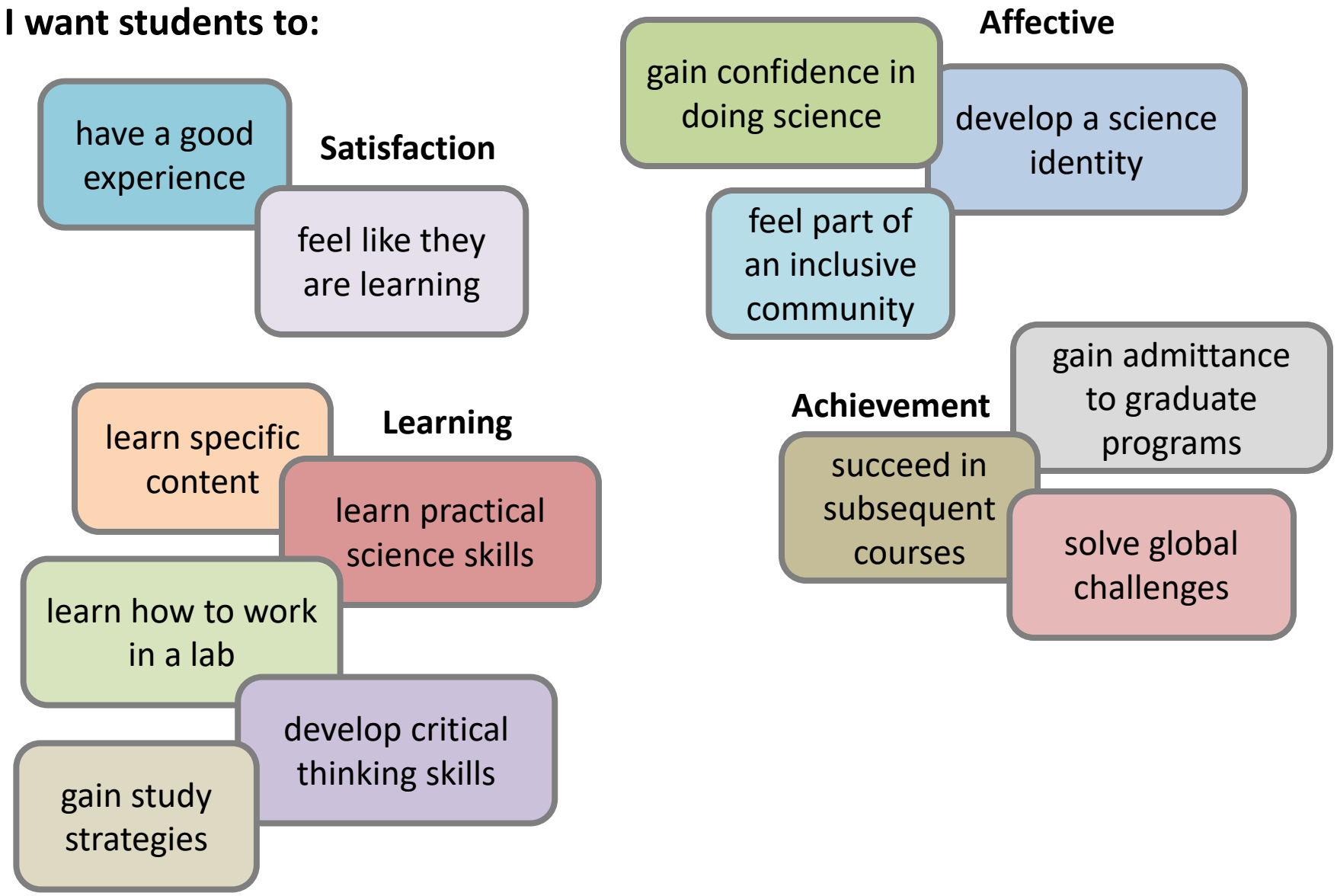


Some desired outcomes of undergraduate courses

I want students to:



Some desired outcomes of undergraduate courses



Some desired outcomes of undergraduate courses

I want students to:

Satisfaction

- have a good experience
- feel like they are learning

Affective

- gain confidence in doing science
- develop a science identity
- feel part of an inclusive community

Learning

- learn specific content
- learn practical science skills
- learn how to work in a lab
- develop critical thinking skills
- gain study strategies

Achievement

- gain admittance to graduate programs
- succeed in subsequent courses
- solve global challenges

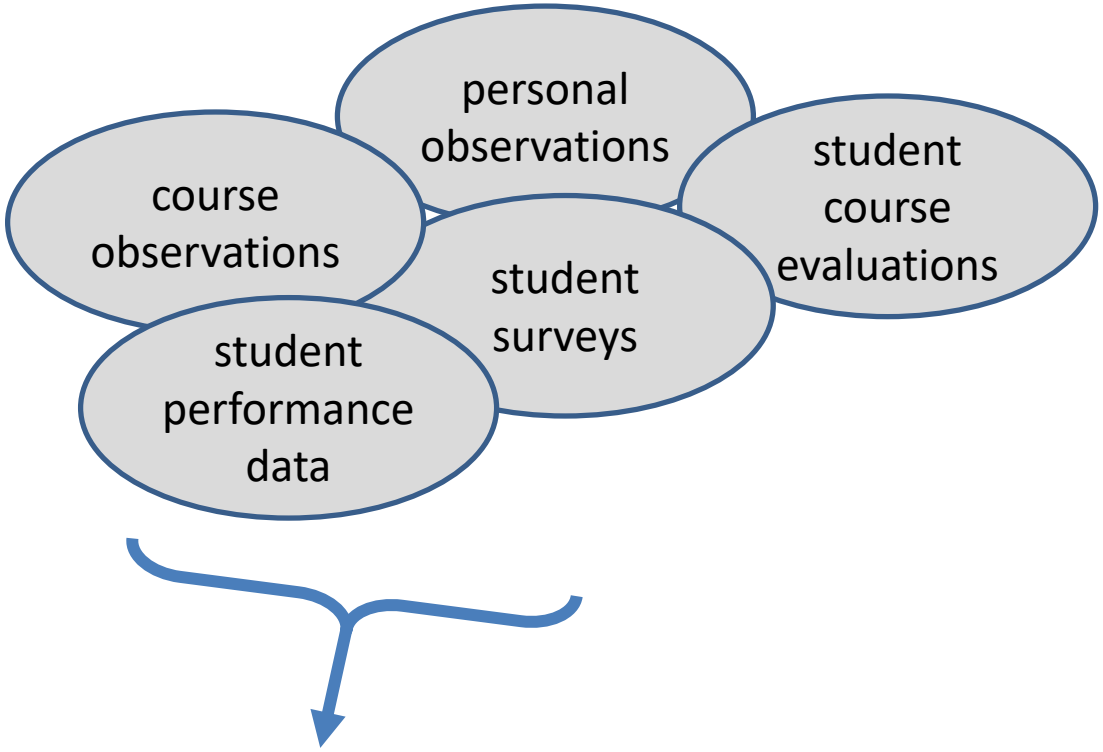
What sources of data can you use to determine whether your students are meeting these outcomes?

What sources of data can you use to determine whether your students are meeting these outcomes?

Satisfaction	Learning	Effectiveness	Achievement

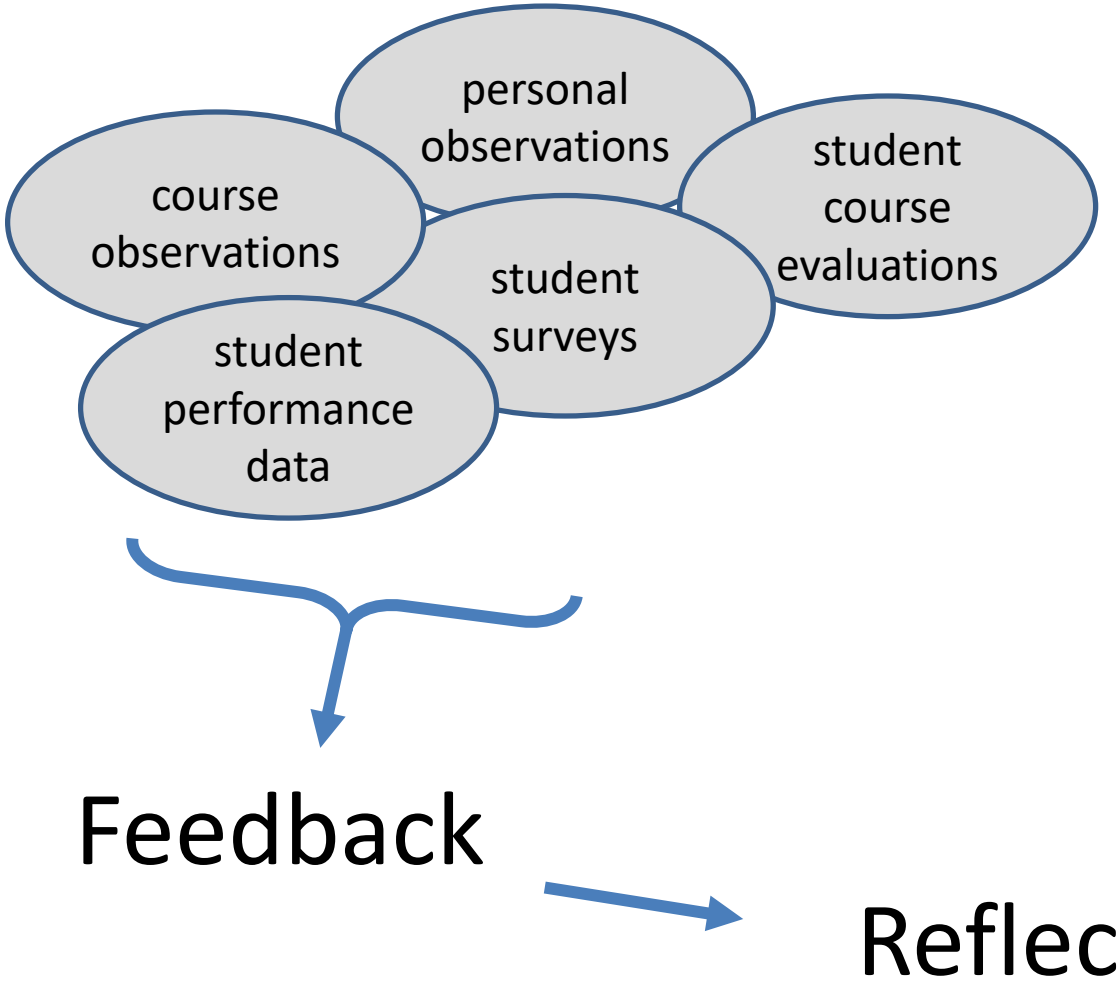
Share on this slide by clicking the  *icon in the vertical toolbar to the left, creating a text box, and typing.*

Using informed reflection as a means to facilitate instructional improvement

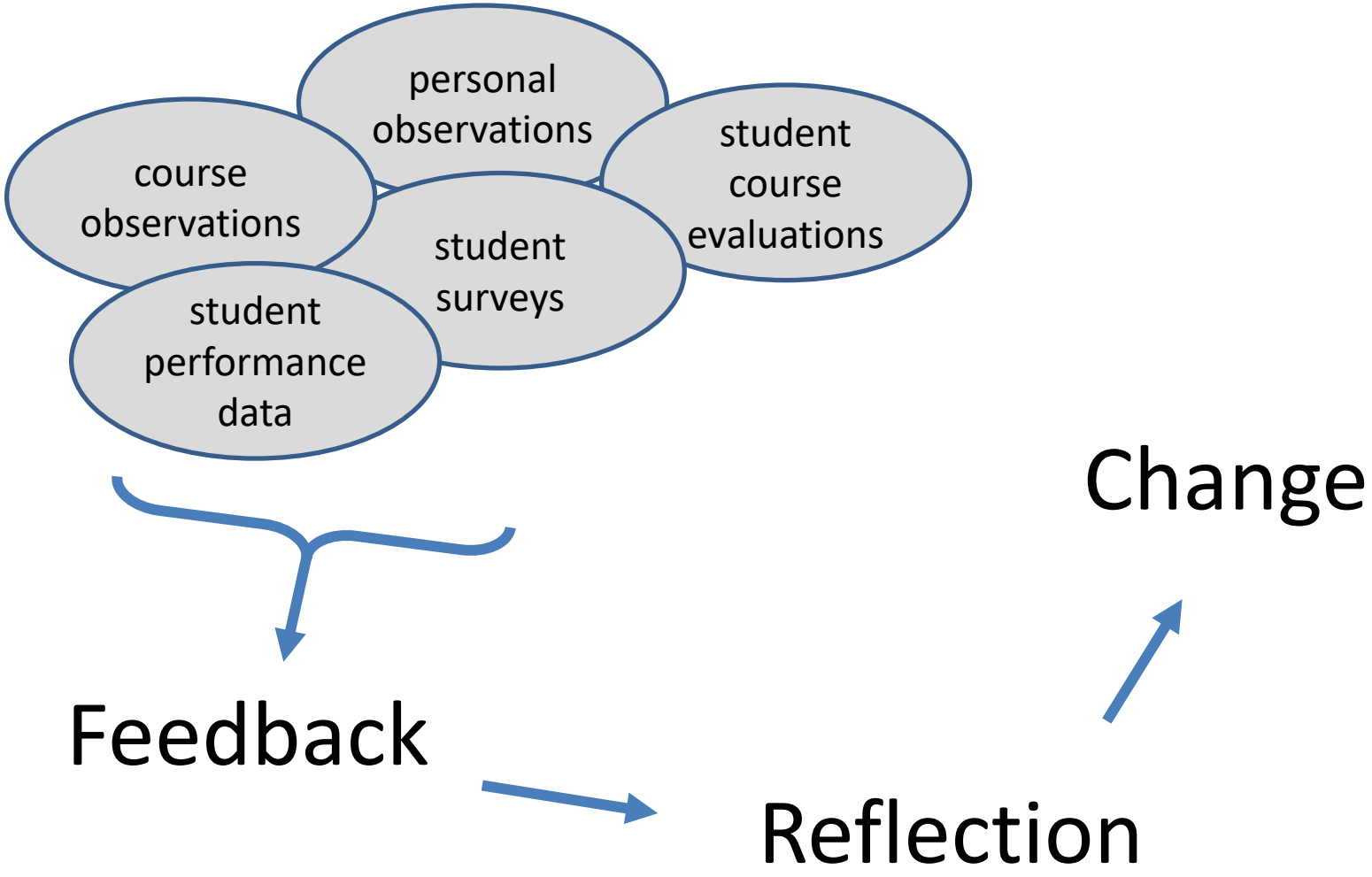


Feedback

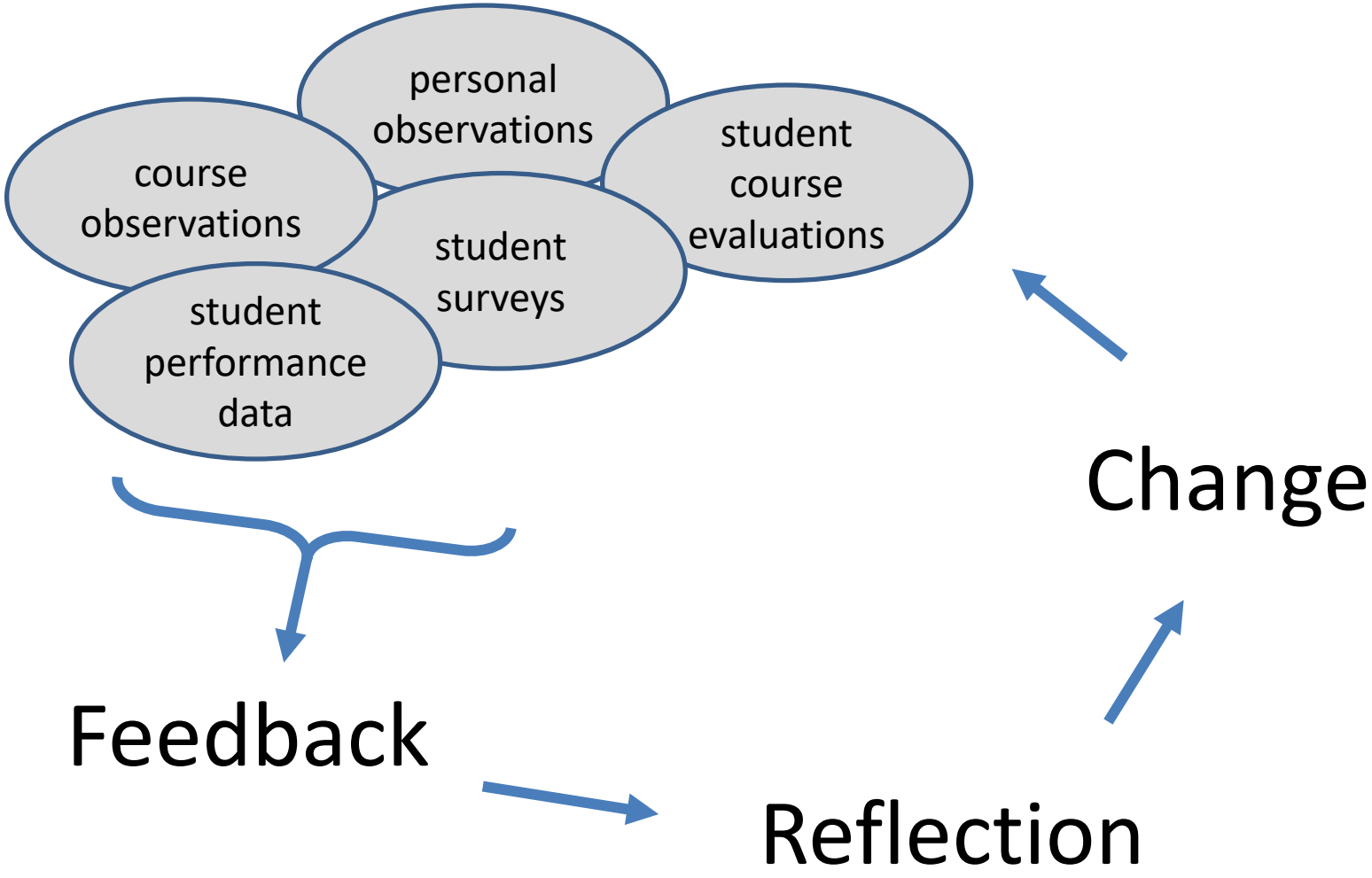
Using informed reflection as a means to facilitate instructional improvement



Using informed reflection as a means to facilitate instructional improvement



Using informed reflection as a means to facilitate instructional improvement



Personal observations

Pros
- Easy to collect
- Made in real-time
- High value to the teacher

Personal observations

Pros

- Easy to collect
- Made in real-time
- High value to the teacher

Cons

- Poor sampling
- Prone to outliers
- Highly subjective

Personal observations

Pros
- Easy to collect
- Made in real-time
- High value to the teacher

Cons
- Poor sampling
- Prone to outliers
- Highly subjective

Strategies

- Use on a limited, as-needed basis
- Convert anecdotal sampling into more systematic methods

Students appear confused → **Clickers, Muddiest point, One-minute paper**

- Collect corroborating evidence from other sources

Student course evaluations

Pros
- Part of course norms
- Often anonymized
- Valued by some people

Student course evaluations

Pros

- Part of course norms
- Often anonymized
- Valued by some people

Cons

- Limited correlation with learning
- Prone to biases
- Occur at end of course

Student course evaluations

Pros

- Part of course norms
- Often anonymized
- Valued by some people

Cons

- Limited correlation with learning
- Prone to biases
- Occur at end of course

Strategies

- Conduct mid-semester evaluation(s): Keep, Quit, Change
- Supplement with other closed-ended or open-ended questions that you value
- Be careful about reading them during the semester
- Focus on questions with actionable content

Overall course satisfaction → **Feedback, organization, grading**

Student performance data

Pros
- Collected for grades
- Authentic performance

Student performance data

Pros

- Collected for grades
- Authentic performance

Cons

- Difficult to probe deeper proficiencies
- Biased toward your own teaching

Student performance data

Pros

- Collected for grades
- Authentic performance

Cons

- Difficult to probe deeper proficiencies
- Biased toward your own teaching

Strategies

- Make sure assessments are aligned with learning objectives
- Use published instruments, concept inventories
- Give pre-post tests, compare across years
- Consider test security and possible cheating

Student surveys

Pros
- Only way to collect affective opinions
- Probe other important course outcomes

Student surveys

Pros

- Only way to collect affective opinions
- Probe other important course outcomes

Cons

- Somewhat outside course norms
- Proxy for larger outcomes

Student surveys

Pros

- Only way to collect affective opinions
- Probe other important course outcomes

Cons

- Somewhat outside course norms
- Proxy for larger outcomes

Strategies

- Use published instruments: views of learning, views toward disciplines, motivation, ownership, belonging, beliefs, self-efficacy, etc.

- Keep short and focused, explain to students why collecting this information, give course credit

Course observations

Pros
- Incorporates expert judgment
- Reveals blind spots

Course observations

Pros

- Incorporates expert judgment
- Reveals blind spots

Cons

- Resource intensive
- Intimidating

Course observations

Pros

- Incorporates expert judgment
- Reveals blind spots

Cons

- Resource intensive
- Intimidating

Strategies

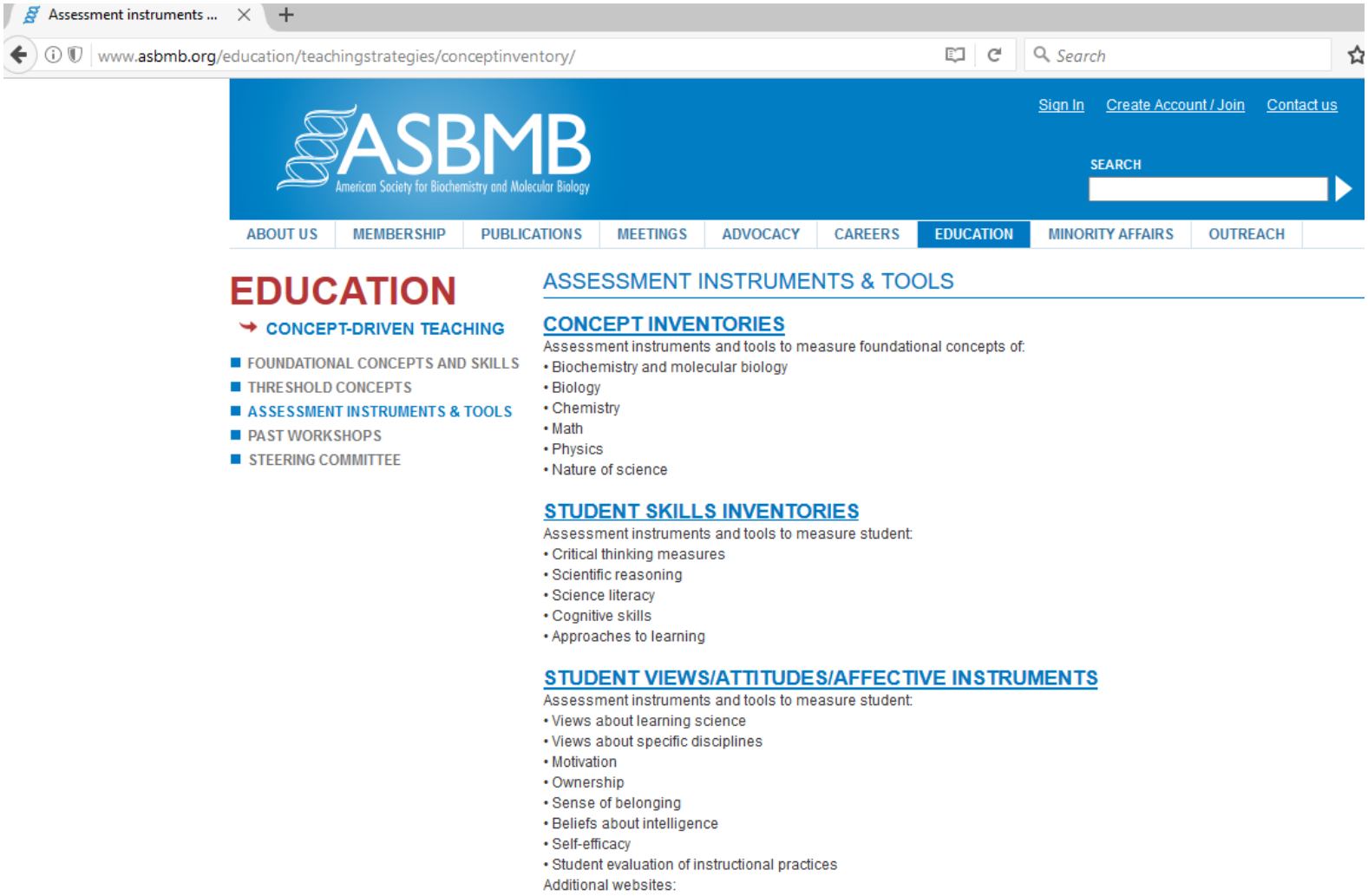
- Use for any aspect of course: syllabus, materials, class delivery, assignments, exams

- Collect feedback from different sources, establish relationship over time

- Keep observations objective and informative

ASBMB list of instruments

http://www.asbmb.org/education/teachingstrategies/conceptinventory/



A strategy for course observation

Provide information

Observe

Meet for coffee

A strategy for course observation

Provide information

Observe

Meet for coffee

Regarding:

- the instructor's instruction
- the instructor's interaction with students
- students' engagement in the learning process
- other things the instructor asked me to observe

I observed…

Documenting evidence of effective teaching

- student surveys
- student performance data
- course observations
- personal observations
- student course evaluations

If you were on a hiring committee, which of these sources would provide the most powerful evidence of a commitment to instructional improvement. Rank them.

Rank these sources from most powerful evidence of commitment to instructional improvement to least powerful

Data source	1 – most powerful	2	3	4	5 – least powerful
Student surveys					
Student performance data					
Course observations					
Personal observations					
Student course evaluations					

Use the textbox tool  *to put an "X" in the box that matches your ranking for each data source*

CIRTL

Documenting evidence of effective teaching

- student surveys
- student performance data
- course observations
- personal observations
- student course evaluations

If you were on a hiring committee, which of these sources would provide the most powerful evidence of a commitment to instructional improvement. Rank them.

How will you collect this evidence to document your teaching practice and communicate this to a hiring committee? Make a plan for one piece of evidence, then share with your group.

How will you collect this evidence to document your teaching practice and communicate it to a hiring committee?

Reflect individually on how you would collect a piece of evidence of your choosing.

Move into breakout rooms for a small group discussion where each group member shares their plan.

Return to the main room ready to share a single plan from your group.

Share on this slide by clicking the  *icon in the vertical toolbar to the left, creating a text box, and typing.*

How will you collect this evidence to document your teaching practice and communicate it to a hiring committee?

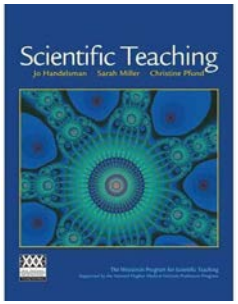
Share a single piece of evidence and how your group would collect it

Room 1	Room 2	Room 3	Room 4	Room 5
Room 6	**Room 7**	**Room 8**	**Room 9**	**Room 10**

Share on this slide by clicking the  *icon in the vertical toolbar to the left, creating a text box, and typing.*

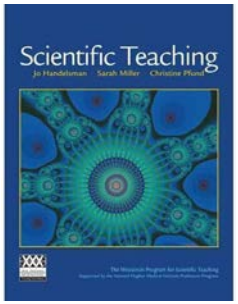
CIRTL

Another strategy for documenting teaching practices



Scientific Teaching encapsulates best practices

Another strategy for documenting teaching practices



Scientific Teaching encapsulates best practices

CBE—Life Sciences Education
Vol. 14, 1–12, Spring 2015

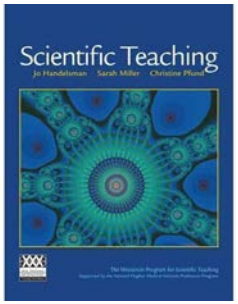
Article

Scientific Teaching: Defining a Taxonomy of Observable Practices

Brian A. Couch,*† Tanya L. Brown,* Tyler J. Schelpat,* Mark J. Graham,‡ and Jennifer K. Knight*

Couch et al. (2015) CBE-LSE

Another strategy for documenting teaching practices



Scientific Teaching encapsulates best practices

CBE—Life Sciences Education
Vol. 14, 1–12, Spring 2015

Article

Scientific Teaching: Defining a Taxonomy of Observable Practices

Brian A. Couch,*† Tanya L. Brown,* Tyler J. Schelpat,* Mark J. Graham,‡ and Jennifer K. Knight*

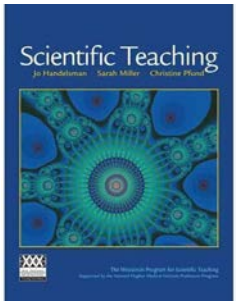
Couch et al. (2015) CBE-LSE

Measurement Instrument for Scientific Teaching (MIST): A Tool to Measure the Frequencies of Research-Based Teaching Practices in Undergraduate Science Courses

Mary F. Durham,† Jennifer K. Knight,‡ and Brian A. Couch†*

Durham et al. (2017) CBE-LSE
Durham et al. (In press) Int J STEM Educ

Another strategy for documenting teaching practices



Scientific Teaching encapsulates best practices


CBE—Life Sciences Education
Vol. 14, 1–12, Spring 2015

Article

Scientific Teaching: Defining a Taxonomy of Observable Practices

Brian A. Couch,*† Tanya L. Brown,* Tyler J. Schelpat,* Mark J. Graham,‡ and Jennifer K. Knight*

Couch et al. (2015) CBE-LSE


Measurement Instrument for Scientific Teaching (MIST): A Tool to Measure the Frequencies of Research-Based Teaching Practices in Undergraduate Science Courses

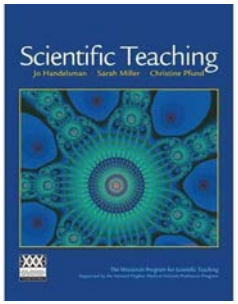
Mary F. Durham,† Jennifer K. Knight,‡ and Brian A. Couch†*

Durham et al. (2017) CBE-LSE
Durham et al. (In press) Int J STEM Educ

Active learning
Learning goal use
Inclusivity
Responsiveness

Experimental design
Data analysis
Cognitive skills
Reflection

Another strategy for documenting teaching practices



Scientific Teaching encapsulates best practices

CBE—Life Sciences Education
Vol. 14, 1–12, Spring 2015

Article

Scientific Teaching: Defining a Taxonomy of Observable Practices

Brian A. Couch,*† Tanya L. Brown,* Tyler J. Schelpat,* Mark J. Graham,‡ and Jennifer K. Knight*

Couch et al. (2015) CBE-LSE

Measurement Instrument for Scientific Teaching (MIST): A Tool to Measure the Frequencies of Research-Based Teaching Practices in Undergraduate Science Courses

Mary F. Durham,† Jennifer K. Knight,‡ and Brian A. Couch†*

Durham et al. (2017) CBE-LSE
Durham et al. (In press) Int J STEM Educ

MIST

Measurement Instrument for Scientific Teaching

Active learning
Learning goal use
Inclusivity
Responsiveness
Experimental design
Data analysis
Cognitive skills
Reflection

MIST can be completed by:

Instructor

Students

Observer

MIST score report documents teaching practices

MIST

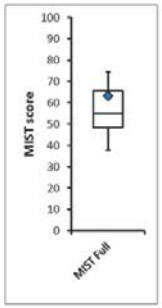
Measurement Instrument for Scientific Teaching

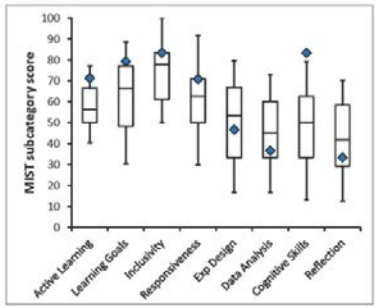
Instructor: Example Instructor Course: Example Course 101 Semester: Fall 2017

Thank you for using the MIST (Measurement Instrument for Scientific Teaching)!
Below you will find the results from both your survey responses and your students responses.

Part 1: Individual scores and comparisons to student responses:

The MIST composite score indicates the overall level of scientific teaching occuring in your course on a scale of 0-100.
The MIST subscores indicate the levels of each group of teaching practices, each on a scale of 0-100.
There is no ideal score in any category.

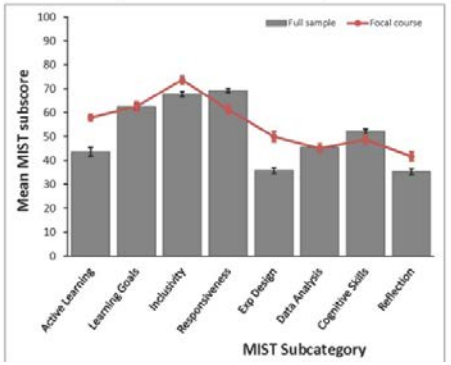




The boxes display student medians, 1st, and 3rd quartiles, and the whiskers indicate the 5th and 95th percentiles of student responses. The blue diamonds are scores based on your responses.

Part 2: Individual scores compared to the full sample of study participants:

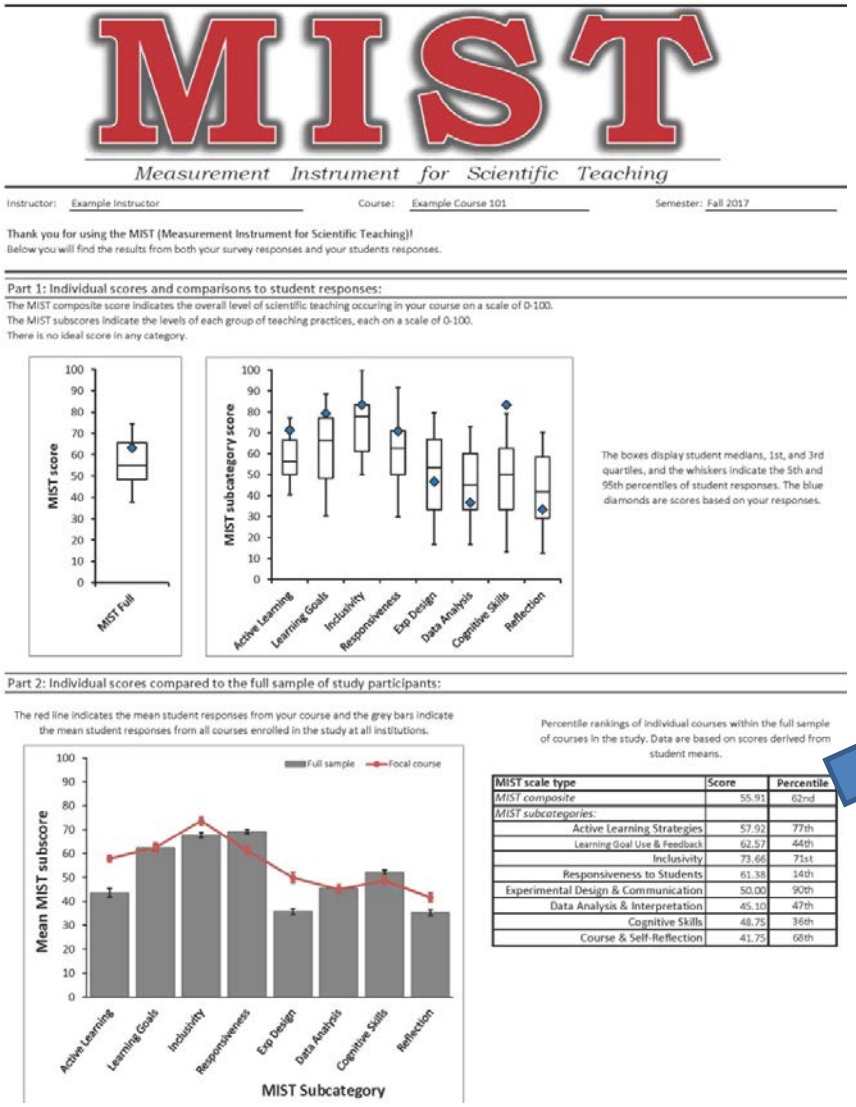
The red line indicates the mean student responses from your course and the grey bars indicate the mean student responses from all courses enrolled in the study at all institutions.



Percentile rankings of individual courses within the full sample of courses in the study. Data are based on scores derived from student means.

MIST scale type	Score	Percentile
MIST composite	55.91	62nd
MIST subcategories:		
Active Learning Strategies	57.92	77th
Learning Goal Use & Feedback	62.57	44th
Inclusivity	73.66	71st
Responsiveness to Students	61.38	14th
Experimental Design & Communication	50.00	90th
Data Analysis & Interpretation	45.10	47th
Cognitive Skills	48.75	36th
Course & Self-Reflection	41.75	68th

MIST score report documents teaching practices



MIST

Measurement Instrument for Scientific Teaching

Instructor: Example Instructor Course: Example Course 101 Semester: Fall 2017

Thank you for using the MIST (Measurement Instrument for Scientific Teaching)!
Below you will find the results from both your survey responses and your students responses.

Part 1: Individual scores and comparisons to student responses:

The MIST composite score indicates the overall level of scientific teaching occuring in your course on a scale of 0-100.
The MIST subscores indicate the levels of each group of teaching practices, each on a scale of 0-100.
There is no ideal score in any category.

The boxes display student medians, 1st, and 3rd quartiles, and the whiskers indicate the 5th and 95th percentiles of student responses. The blue diamonds are scores based on your responses.

Part 2: Individual scores compared to the full sample of study participants:

The red line indicates the mean student responses from your course and the grey bars indicate the mean student responses from all courses enrolled in the study at all institutions.

Percentile rankings of individual courses within the full sample of courses in the study. Data are based on scores derived from student means.

MIST scale type	Score	Percentile
MIST composite	55.91	62nd
MIST subcategories:		
Active Learning Strategies	57.92	77th
Learning Goal Use & Feedback	62.57	44th
Inclusivity	73.66	71st
Responsiveness to Students	61.38	14th
Experimental Design & Communication	50.00	90th
Data Analysis & Interpretation	45.10	47th
Cognitive Skills	48.75	36th
Course & Self-Reflection	41.75	68th

MIST scale type	Score	Percentile
MIST composite	55.91	62nd
MIST subcategories:		
Active Learning Strategies	57.92	77th
Learning Goal Use & Feedback	62.57	44th
Inclusivity	73.66	71st
Responsiveness to Students	61.38	14th
Experimental Design & Communication	50.00	90th
Data Analysis & Interpretation	45.10	47th
Cognitive Skills	48.75	36th
Course & Self-Reflection	41.75	68th

Using student surveys as a means to promote reflective learning

Benefits for you

- You get to see information on how your students are perceiving or interacting with the course.
- You can make adjustments to your teaching to help students better understand your intentions and how to learn.

Using student surveys as a means to promote reflective learning

Benefits for you

- You get to see information on how your students are perceiving or interacting with the course.
- You can make adjustments to your teaching to help students better understand your intentions and how to learn.

Benefits for students

- The act of completing the survey can stimulate students to reflect on their own learning and study strategies.
- Seeing you respond to their data will make them believe that you care and want to see them succeed.

An example of how surveys benefit instructors and students

We asked students:

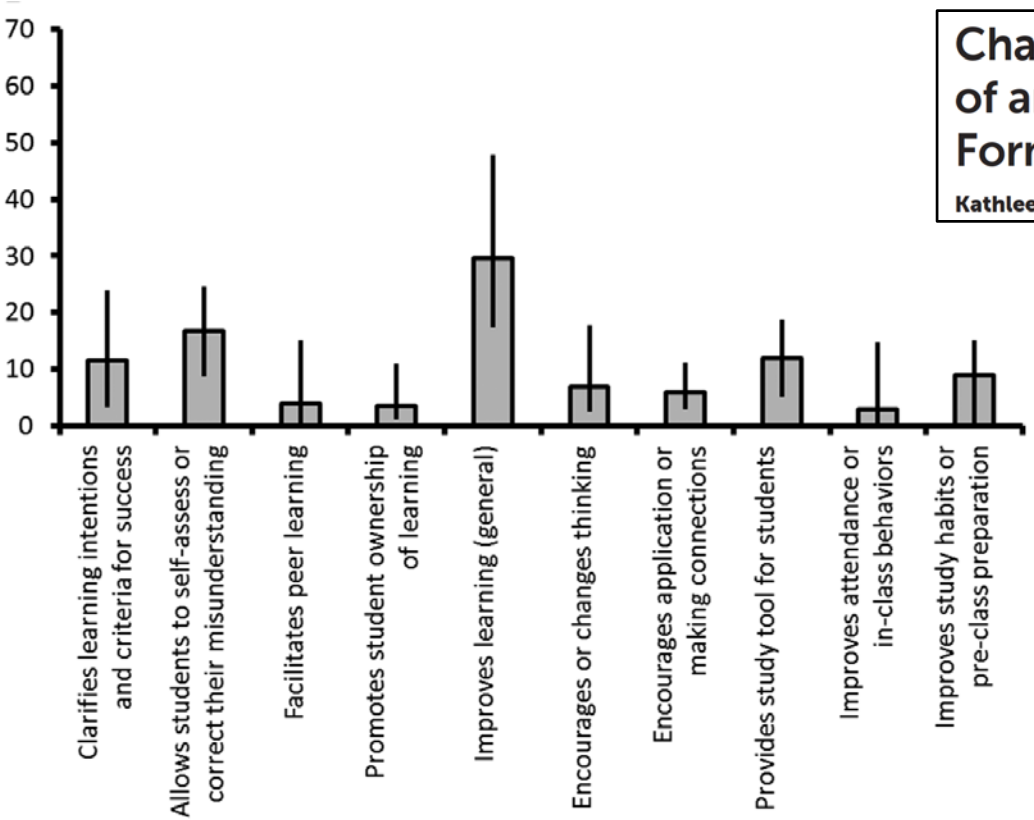
- Why do you think [clickers] are used in this course?
- **How has the use of [clickers] influenced your learning?**
- How has the use of [clickers] influenced your instructor's teaching?
- How might the use of [clickers] be changed to improve your learning?

Brazeal et al. (2016) CBE-LSE

An example of how surveys benefit instructors and students

We asked students:

- Why do you think [clickers] are used in this course?
- **How has the use of [clickers] influenced your learning?**
- How has the use of [clickers] influenced your instructor's teaching?
- How might the use of [clickers] be changed to improve your learning?



Characterizing Student Perceptions of and Buy-In toward Common Formative Assessment Techniques

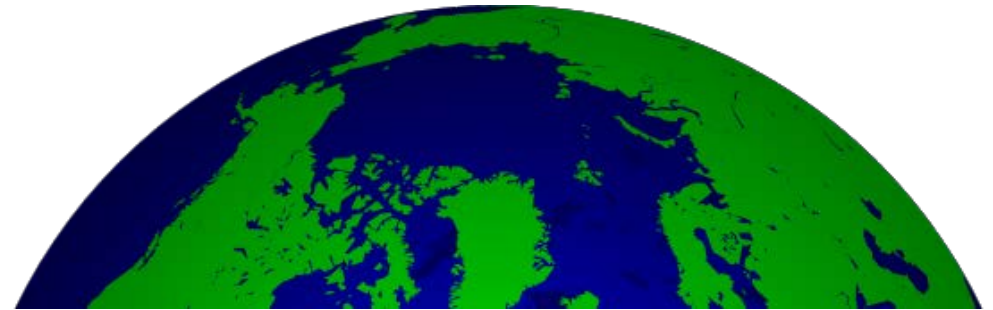
Kathleen R. Brazeal,[†] Tanya L. Brown,[‡] and Brian A. Couch[†*]

Brazeal et al. (2016) CBE-LSE

Workshop overview

1. **Collecting and leveraging evidence for instructional improvement**
   - Doing informed reflection
   - Documenting teaching practices

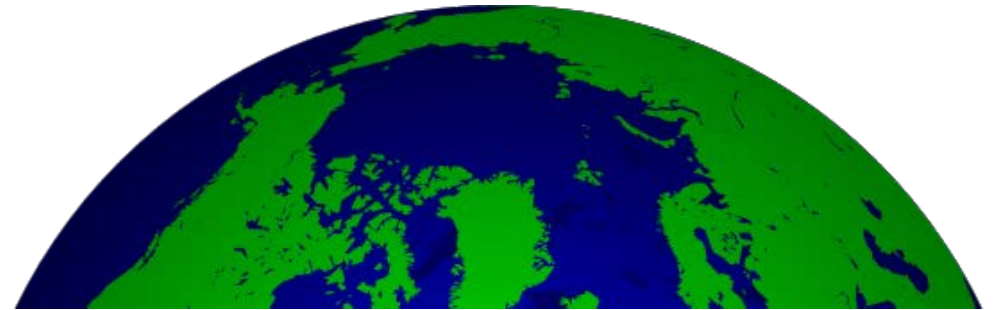
2. **Designing a teaching-as-research project**
   - Elements of research design
   - Example of course-based research



Workshop overview

1. **Collecting and leveraging evidence for instructional improvement**
   - Doing informed reflection
   - Documenting teaching practices

2. **Designing a teaching-as-research project**
   - Elements of research design
   - Example of course-based research



General idea behind teaching-as-research

The classroom environment yields millions of data points each semester.

With some deliberate planning, a course can be a great place to conduct research.

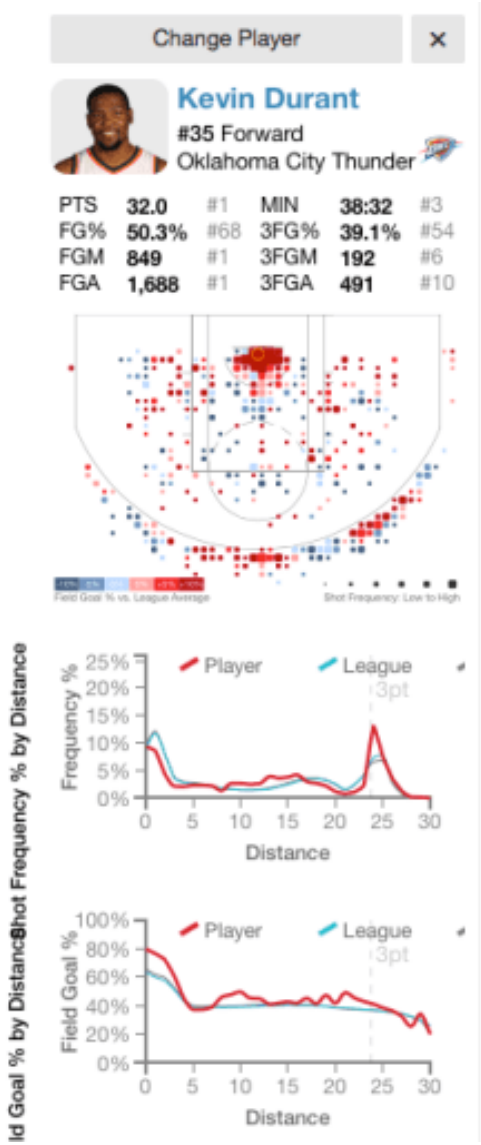
This research can provide a means to documenting and improving the course.

General idea behind teaching-as-research

The classroom environment yields millions of data points each semester.

With some deliberate planning, a course can be a great place to conduct research.

This research can provide a means to documenting and improving the course.



Identify a research question

Course research starts with a good research question:

Are these good research questions? Could you modify these questions to make them more amenable to research?

- Are my students learning?

- Do students learn better when I use a particular teaching method?

- Do inquiry based labs help my students develop problem-solving skills?

- Which exam question format provides the best picture of student learning?

How could you improve these research questions?

First names A-C: Are my students learning?	**First names D-H:** Do students learn better when I use a particular teaching method?	**First names I-M:** Do inquiry based labs help my students develop problem-solving skills?	**First names N-V** Which exam question format provides the best picture of student learning?

Share on this slide by clicking the  *icon in the vertical toolbar to the left, creating a text box, and typing.*

CIRTL

Elements of a good research question

Good research questions:

- Focus on specific phenomena

- Imply measureable outcomes

- Investigate tractable systems

- Can be completed with available resources

- Address a broader problem

Elements of a good research question

Good research questions:

- Focus on specific phenomena
- Imply measureable outcomes
- Investigate tractable systems
- Can be completed with available resources
- Address a broader problem

Come up with a research question that you would want to investigate in your teaching.

Scale your project to the available resources

In considering your research design, you first need to think about how broadly you want to generalize your results.

My own course

Other courses like mine

Other courses in my discipline

Undergraduate STEM courses

Scale your project to the available resources

In considering your research design, you first need to think about how broadly you want to generalize your results.

My own course

Other courses like mine

Other courses in my discipline

Undergraduate STEM courses

The generalizability of your research depends on the nature of your research question and student population.

Scale your project to the available resources

In considering your research design, you first need to think about how broadly you want to generalize your results.

My own course

Other courses like mine

Other courses in my discipline

Undergraduate STEM courses

The generalizability of your research depends on the nature of your research question and student population.

Only need IRB approval if you plan to present or publish publicly, (but check with your local IRB).

Designing your research methodology

Always put the education of your students first.

- The best studies are imperceptible to students.
- Don’t tell your students they are guinea pigs or lab rats!
- Be careful about changing things mid-semester.

Designing your research methodology

Always put the education of your students first.

- The best studies are imperceptible to students.
- Don't tell your students they are guinea pigs or lab rats!
- Be careful about changing things mid-semester.

Many valuable studies can done with fairly little intervention and minimal analysis time.

- Getting students to attend class on Fridays.
- How do students perceive the new exam center.
- Does balloon intervention help students understand randomness.

Designing your research methodology

Always put the education of your students first.

- The best studies are imperceptible to students.
- Don't tell your students they are guinea pigs or lab rats!
- Be careful about changing things mid-semester.

Many valuable studies can done with fairly little intervention and minimal analysis time.

- Getting students to attend class on Fridays.
- How do students perceive the new exam center.
- Does balloon intervention help students understand randomness.

Make sure there is close alignment between your research question → intervention → instruments.

Designing your research methodology

Always put the education of your students first.

- The best studies are imperceptible to students.
- Don't tell your students they are guinea pigs or lab rats!
- Be careful about changing things mid-semester.

Many valuable studies can done with fairly little intervention and minimal analysis time.

- Getting students to attend class on Fridays.
- How do students perceive the new exam center.
- Does balloon intervention help students understand randomness.

Make sure there is close alignment between your research question → intervention → instruments.

Choose a level of proof that is appropriate for your scope of inference.

An example of course-based research

Background: Clickers with Peer Instruction

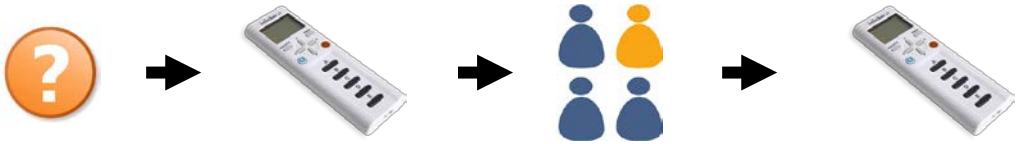
Crouch and Mazur (1996) Am J Physics
Vickrey et al. (2015) CBE-LSE

An example of course-based research

Background: Clickers with Peer Instruction

Crouch and Mazur (1996) Am J Physics
Vickrey et al. (2015) CBE-LSE

Sequence:



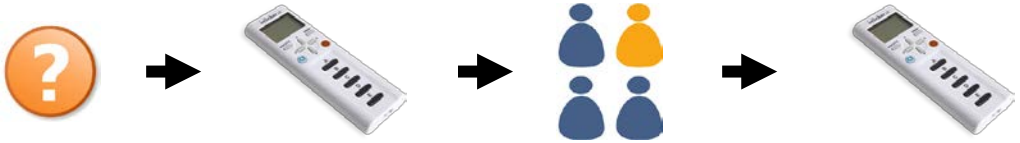
Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote)

An example of course-based research

Background: Clickers with Peer Instruction

Crouch and Mazur (1996) Am J Physics
Vickrey et al. (2015) CBE-LSE

Sequence:



Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote)

Why Peer Discussion Improves Student Performance on In-Class Concept Questions

M. K. Smith,[1*] W. B. Wood,[1] W. K. Adams,[2] C. Wieman,[2,3] J. K. Knight,[1] N. Guild,[1] T. T. Su[1]

Research question:
Do clickers help students learn?

An example of course-based research

Background: Clickers with Peer Instruction

Crouch and Mazur (1996) Am J Physics
Vickrey et al. (2015) CBE-LSE

Sequence:

Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote) → Pose isomorphic question → Answer individually (isomorphic question)

Why Peer Discussion Improves Student Performance on In-Class Concept Questions

M. K. Smith,[1*] W. B. Wood,[1] W. K. Adams,[2] C. Wieman,[2,3] J. K. Knight,[1] N. Guild,[1] T. T. Su[1]

Research question:

Do clickers help students learn?

An example of course-based research

Background: Clickers with Peer Instruction

Crouch and Mazur (1996) Am J Physics
Vickrey et al. (2015) CBE-LSE

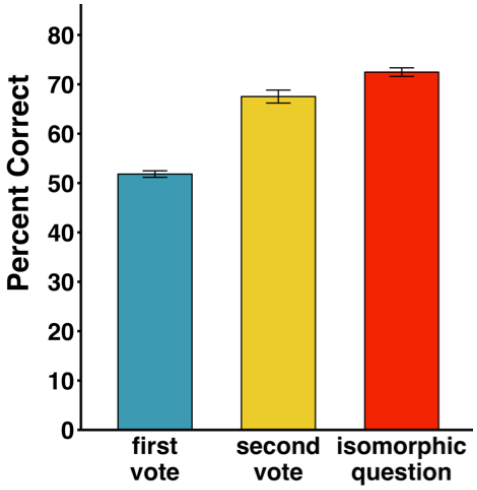
Sequence:

Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote) → Pose isomorphic question → Answer individually (isomorphic question)

Why Peer Discussion Improves Student Performance on In-Class Concept Questions

M. K. Smith,[1*] W. B. Wood,[1] W. K. Adams,[2] C. Wieman,[2,3] J. K. Knight,[1] N. Guild,[1] T. T. Su[1]

Research question:
Do clickers help students learn?



Adapted from Smith et al. (2009) Science

An example of course-based research

Research questions:

Do clickers with peer instruction help students perform better on later exams?

Do the benefits of clickers extend to all students?

Hubbard and Couch (2018) Comp and Educ

An example of course-based research

Research questions:

Do clickers with peer instruction help students perform better on later exams?

Do the benefits of clickers extend to all students?

Sequence:

Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote) → Pose isomorphic question → Answer individually (isomorphic question)

Hubbard and Couch (2018) Comp and Educ

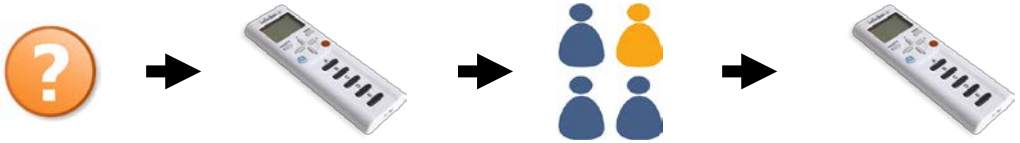
An example of course-based research

Research questions:

Do clickers with peer instruction help students perform better on later exams?

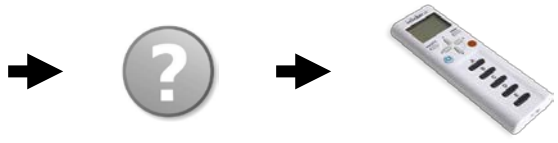
Do the benefits of clickers extend to all students?

Sequence:



Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote)

ON LATER EXAMS



Pose isomorphic question → Answer individually (isomorphic question)

Hubbard and Couch (2018) Comp and Educ

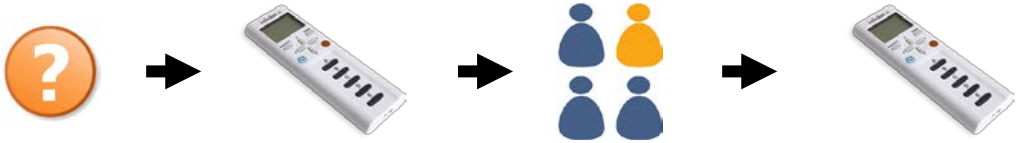
An example of course-based research

Research questions:

Do clickers with peer instruction help students perform better on later exams?

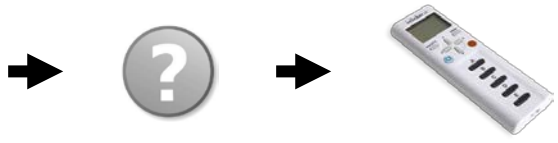
Do the benefits of clickers extend to all students?

Sequence:

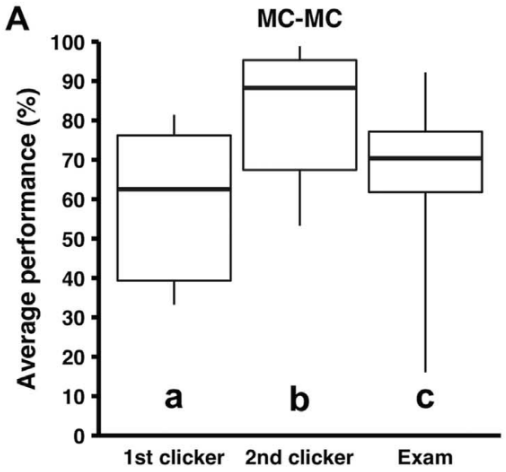


Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote)

ON LATER EXAMS



Pose isomorphic question → Answer individually (isomorphic question)



Hubbard and Couch (2018) Comp and Educ

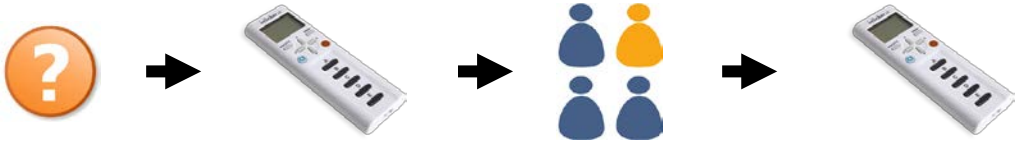
An example of course-based research

Research questions:

Do clickers with peer instruction help students perform better on later exams?

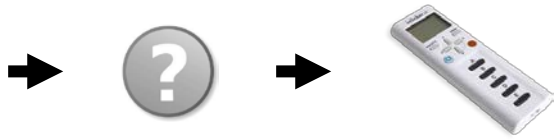
Do the benefits of clickers extend to all students?

Sequence:

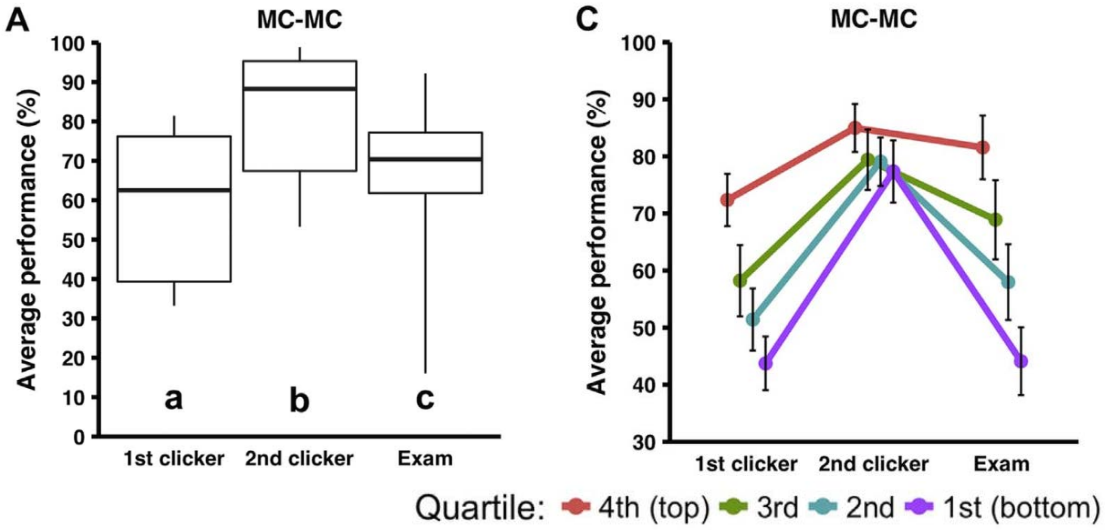


Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote)

ON LATER EXAMS



→ Pose isomorphic question → Answer individually (isomorphic question)



Hubbard and Couch (2018) Comp and Educ

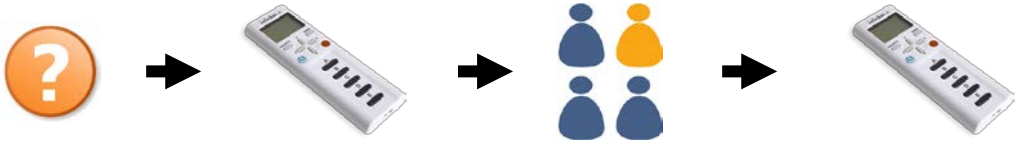
An example of course-based research

Research questions:

Do clickers with peer instruction help students perform better on later exams?

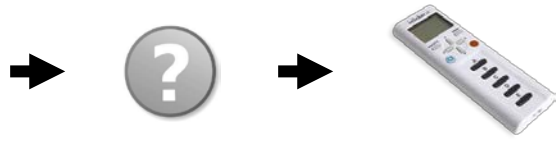
Do the benefits of clickers extend to all students?

Sequence:

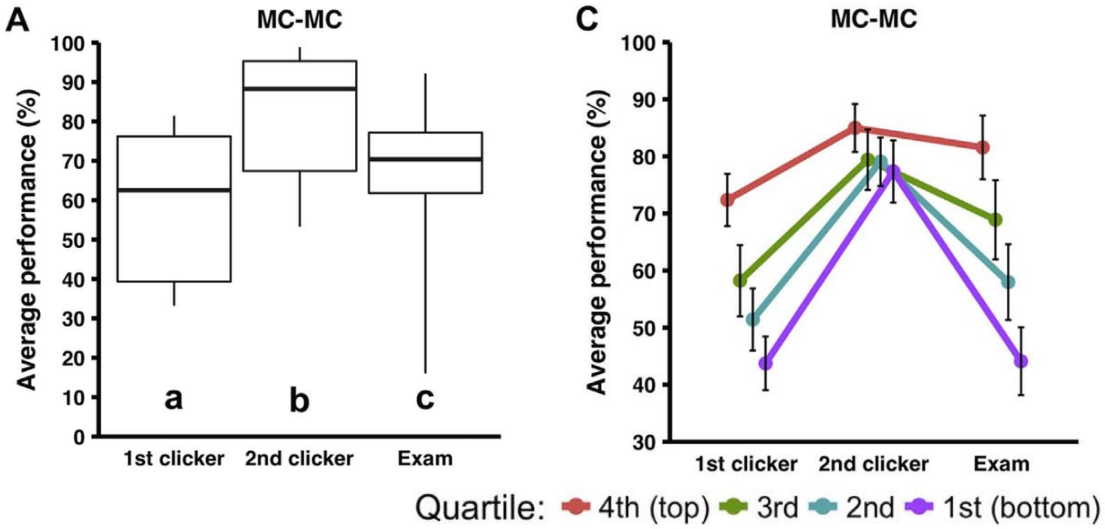


Pose question → Answer individually (first vote) → Peer discussion → Answer individually (second vote)

ON LATER EXAMS



Pose isomorphic question → Answer individually (isomorphic question)



To what level would you generalize these results?

Hubbard and Couch (2018) Comp and Educ

Designing your own course research

1. What is your research question?

2. Does your research design require you to teach differently? What will you need to do in your course?

3. What data will you collect? What will be your independent and dependent variables? What measurements will you use?

4. How will you analyze and interpret your results? What are the limits of what you will be able to conclude?

5. How might you incorporate your findings into your future teaching and professional advancement?

Honing your craft: Building a foundation for a lifetime of instructional improvement

Brian A. Couch

University of Nebraska
School of Biological Sciences

bcouch2@unl.edu

Univ. North Carolina
Jul 26, 2018