

The National Academies of
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BOARD ON SCIENCE EDUCATION

Roundtable on Systemic Change in Undergraduate STEM Education

ASCN Webinar
May 19, 2020

Roundtable Sponsors: W.M. Keck Foundation
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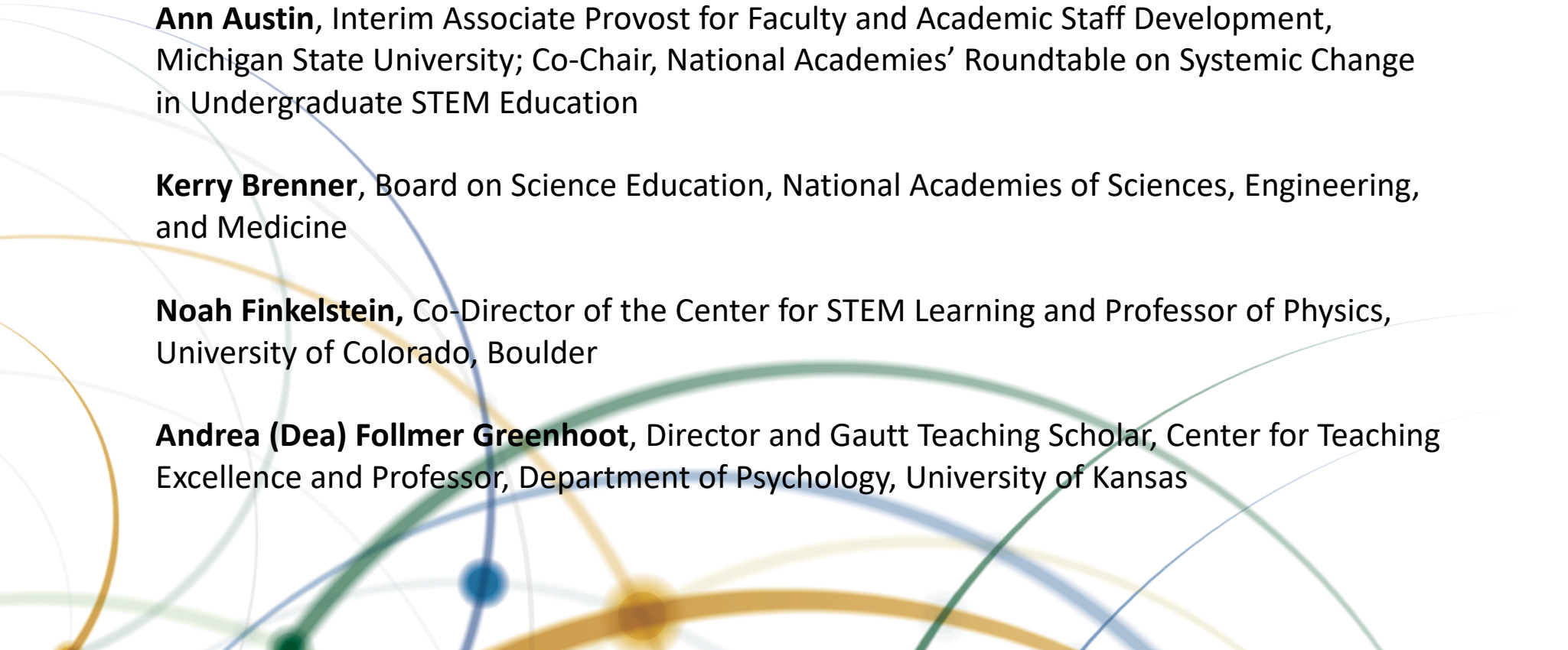
Transforming the Evaluation of Teaching: Framing a National Dialogue

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Goals for Today's Webinar:

Share work and future ideas related to evaluating teaching.

Teaching evaluation as a lever to improve deeper learning by students.

Teaching evaluation as a tool to improve teaching by faculty and instructors.

Using national and campus conversations about teaching evaluation as a way to push thinking about values and incentives that can contribute to systemic change in higher ed.

Plan for Today's Webinar

Overview

September workshop and proceedings

Impact of COVID-19 on thinking about teaching evaluation

Break Out Groups on Ideas for the Future

Reporting back from groups

Roundtable on Systemic Change in Undergraduate STEM Education

A Vision for the Future of Post-secondary STEM Learning

The roundtable focuses on the future of undergraduate STEM learning.

Helps drive a national effort on how best to educate students to be informed members of society and/or participate in the future STEM workforce.

The vision takes into account the dynamic context of higher ed and builds strategies to direct action and inspire change.

Roundtable on Systemic Change in Undergraduate STEM Education

Goals

- Link the full spectrum of stakeholders in higher education.
- Coordinate and catalyze actions to make undergraduate STEM learning more inclusive and engaging.
- Use evidenced-based approaches and build on successful reform efforts.
- Work to expand access, increase equity, and support quality learning experiences for all learners.
- Consider changes in technology, workforce, demographics, and society.
- Help create a scientifically literate public and a well-prepared STEM workforce.

Evaluating Teaching Effectiveness

Transforming the Evaluation of Teaching Workshop

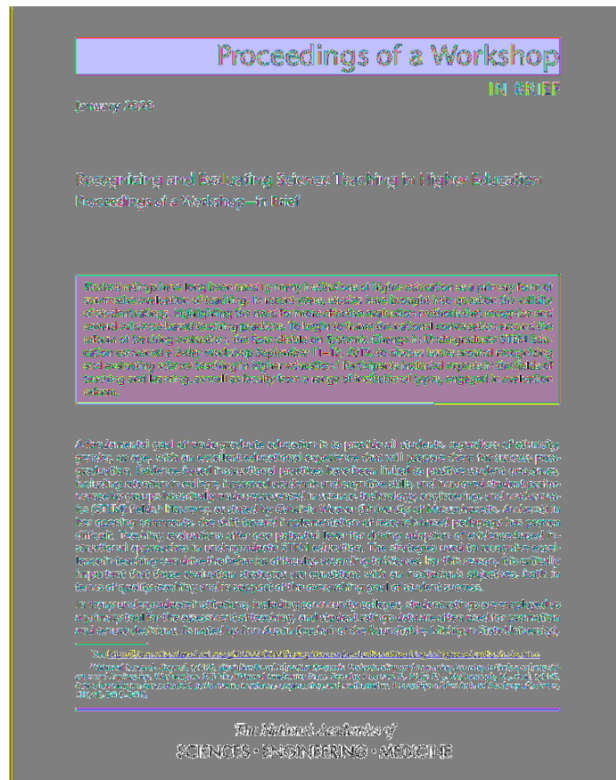
September 11-12, 2019 | Washington, DC

Builds on and in collaboration with other groups working
to improve teaching evaluation



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Recognizing and Evaluating Science Teaching in Higher Education



- Workshop planned to frame the national conversation around the reform of teaching evaluation.
- Participants included experts in the fields of teaching and learning, as well as faculty from a range of institutional types, who are engaged in evaluation reform.

<https://bit.ly/37hMuPU>

Concerns about Typical Approaches to Evaluation of Science Teaching

- Student ratings are a primary form of summative evaluation of teaching.
- There are questions about the validity of student ratings.
- Teaching evaluation approaches typically do not highlight and provide for systematic consideration of the quality and extent of intellectual work involved in excellent teaching.
- More effective evaluation methods can recognize and reward evidence-based teaching practices.

Ideas Underlying Current Initiatives to Reform Teaching Evaluation

- Find ways to value, assess, and reward the full range of teaching-related activities
- Develop suite of assessment strategies that go beyond single measures (e.g., peer observations, reflection, student ratings, teaching philosophy)
- Take an organizational change perspective
- Value progress more than perfection—Move forward, using incremental and iterative efforts and bootstrapping

Take an Organizational Change Approach

- Use multiple levers for change
- Know the context
- Consider communication issues
- Identify partners: on-campus leaders, funders, disciplinary societies and professional societies
- Find ways to address concerns such as uncertainty and fear



TRANSFORMING HIGHER EDUCATION -
MULTIDIMENSIONAL EVALUATION OF TEACHING

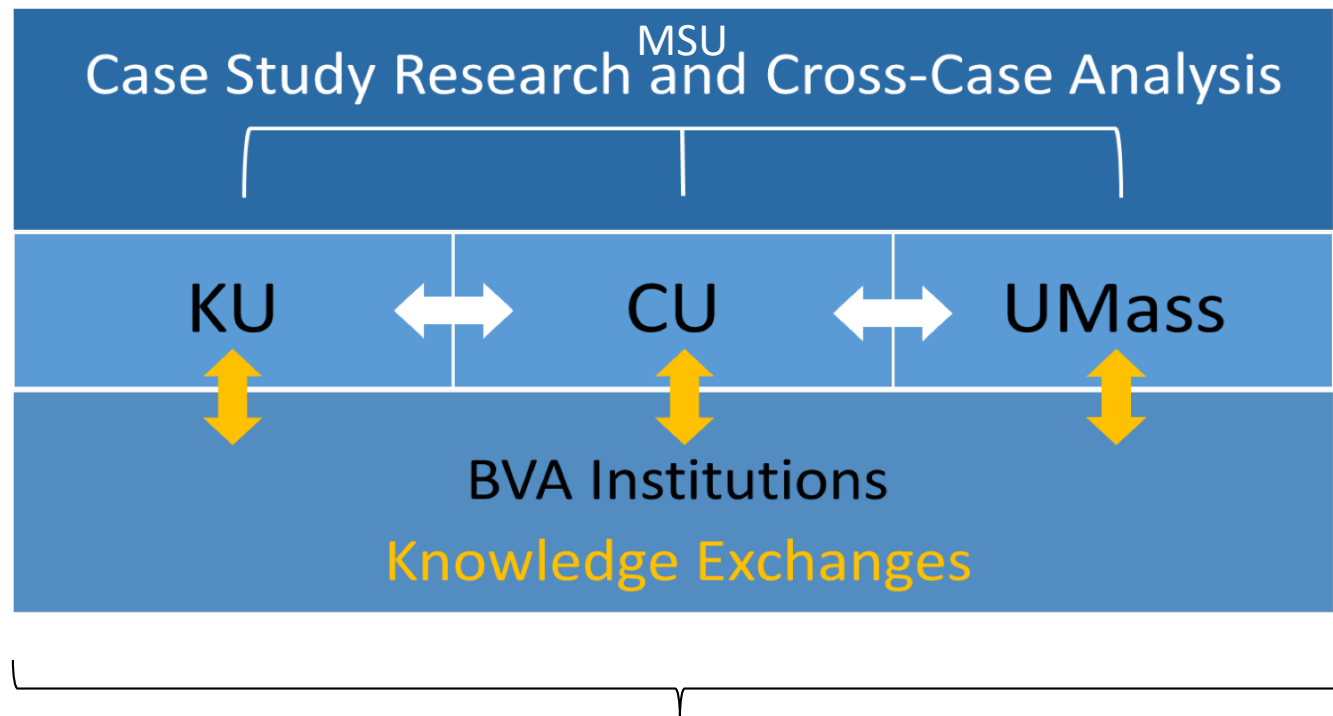
An Example of One National Effort:

**Transforming the Evaluation of Teaching to
Improve Student Learning**



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Studying the adoption and integration of a new approach to teaching eval at three universities

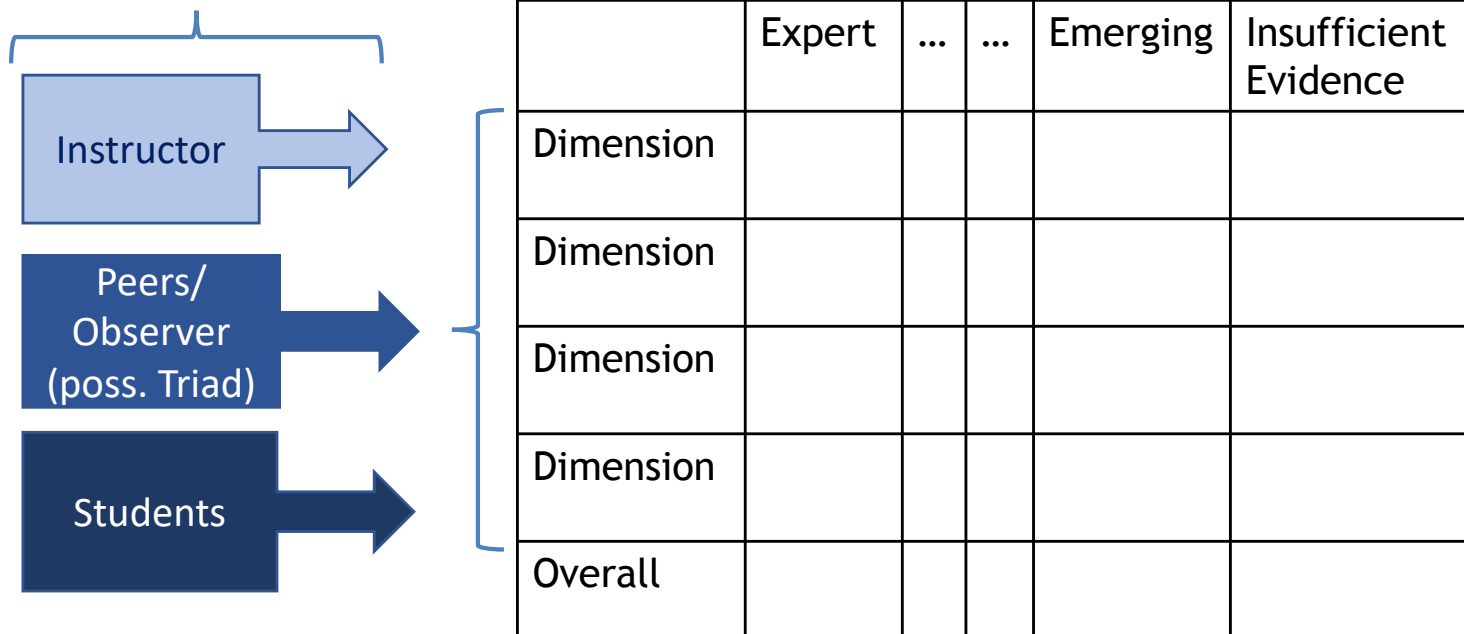


External evaluation: Yale Univ

Our Framework:

Multiple Dimensions, Multiple Lenses

Sources of Evidence
("Lenses")



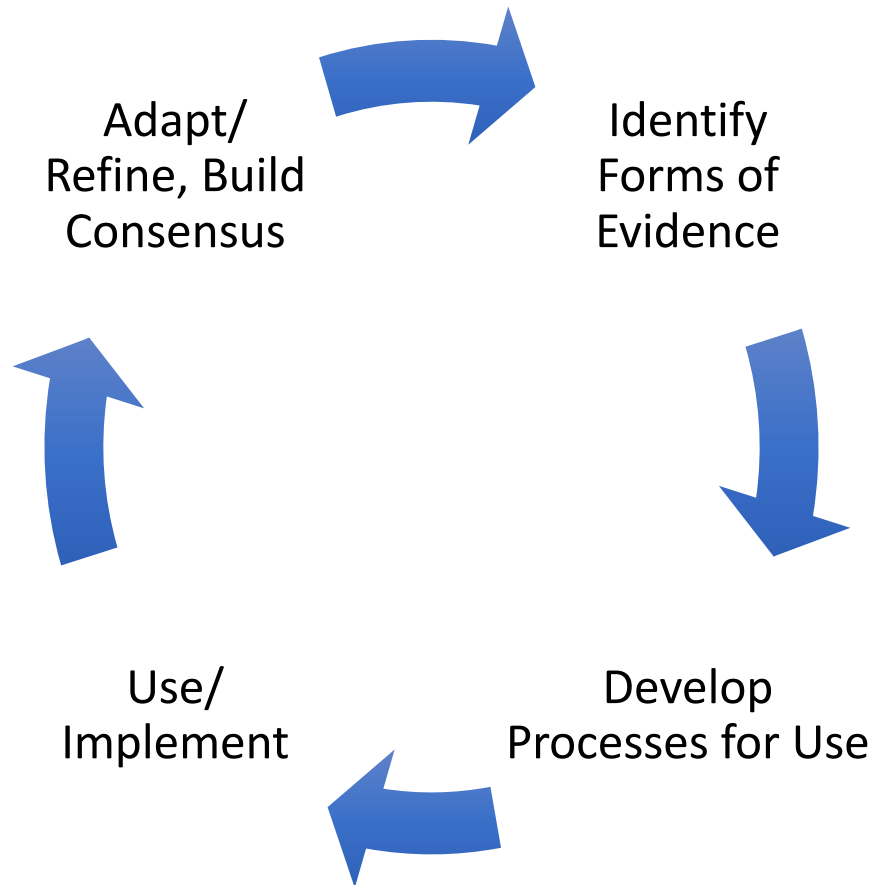
KU Example: Benchmarks for Teaching Effectiveness



Rubric for Faculty Teaching Effectiveness (*department should modify as needed*)

<i>*Departments should align categories with their own expectations for summative evaluation.</i>	Developing	Proficient	Expert
Goals, content, and alignment <i>What are students expected to learn from the courses taught? Are course goals appropriately challenging? Is content aligned with the curriculum?</i>	<ul style="list-style-type: none"> Course goals are unclear, inappropriate, or marginally related to curriculum Content and materials are outdated or unsuitable for students in the courses Range of topics is too narrow or too broad Content is not clearly aligned with curriculum or institutional expectations 	<ul style="list-style-type: none"> Course goals are articulated and appropriate for curriculum Content is current and appropriate for topic, students, and curriculum Course topics include an appropriate range Standard, intellectually sound materials 	<ul style="list-style-type: none"> Course goals are well-articulated, high quality, and clearly connected to program or curricular goals Content is challenging and innovative or related to current issues and developments in field Topics are of appropriate range and depth, with integration across topics High quality materials, well-aligned with course goals
Teaching practices <i>How is in-class and out-of-class time used? What assignments, assessments, and learning activities are implemented to help students learn?</i>	<ul style="list-style-type: none"> Teaching practices are not sufficiently planned or organized, or are poorly implemented Practices are not well executed; little development in methods despite evidence of need Students lack opportunities to practice the skills embedded in course goals Student engagement is variable 	<ul style="list-style-type: none"> Teaching practices are well planned and organized Standard course practices carried out; follows conventions within discipline and institution Students have some opportunities to practice skills embedded in course goals Students consistently engaged 	<ul style="list-style-type: none"> Activities are well planned, integrated, and reflect commitment to providing meaningful assignments and assessments Uses effective, high-impact or innovative methods to improve understanding In- and out-of-class activities provide opportunities for practice and feedback on important skills and concepts Students show high levels of engagement
Achievement of learning outcomes <i>What impact do these courses have on learners? What evidence shows the level of student understanding?</i>	<ul style="list-style-type: none"> Insufficient attention to student learning – quality of student learning is not described or analyzed with clear standards Evidence of poor student learning; low level of skill/understanding is required or achieved without clear attempts to improve 	<ul style="list-style-type: none"> Clear standards for evaluating the quality of student understanding Typical student achievement for courses at these levels 	<ul style="list-style-type: none"> Standards for evaluating student understanding are connected to program or curriculum expectations, or use authentic assessments Efforts to support learning in all students Quality of learning supports success in other contexts (e.g., subsequent courses or non-classroom venues), or is increasing over successive offerings
Classroom climate and student perceptions <i>What are the students' views of their learning experience? How has student feedback informed the faculty member's teaching?</i>	<ul style="list-style-type: none"> Classroom climate does not promote civility or discourages student motivation and engagement Consistently negative student reports of teacher accessibility, interaction skills Poor sense of learning among students Little attempt to address concerns voiced by students 	<ul style="list-style-type: none"> Classroom climate promotes civility No consistently negative student ratings of teacher accessibility, interaction skills Most students indicate progress with their learning Instructor articulates some lessons learned through student feedback 	<ul style="list-style-type: none"> Evidence that classroom climate is respectful, cooperative, and encourages motivation and engagement Student feedback on teacher accessibility, interaction skills is generally positive Students perceive that they are learning important skills or knowledge Instructor is responsive to student feedback in short- and long-term
Reflection and iterative growth <i>How has the faculty member's teaching changed over time? How has this been informed by evidence of student learning?</i>	<ul style="list-style-type: none"> No indication of having reflected upon or learned from prior teaching or feedback 	<ul style="list-style-type: none"> Continued competent teaching, possibly with minor reflection based on input from peers and/or students Articulates some lessons learned from prior teaching and feedback 	<ul style="list-style-type: none"> Regularly makes adjustments to teaching based on reflections on student learning, within or across semesters Examines student performance following adjustments Reports improved student achievement of learning goals based on past course modifications
Mentoring & advising <i>How effectively has the faculty member worked individually with UG or graduate students?</i>	<ul style="list-style-type: none"> No indication of effective mentoring or advising students (but expected in department) 	<ul style="list-style-type: none"> Some evidence of effective advising and mentoring (<i>define as appropriate for discipline</i>) 	<ul style="list-style-type: none"> Evidence of exceptional quality and time commitment to advising and mentoring (<i>define as appropriate for discipline</i>)
Participation in teaching-related activities <i>How has the faculty member contributed to the teaching community?</i>	<ul style="list-style-type: none"> No interaction with broader community about teaching 	<ul style="list-style-type: none"> Some involvement in teaching-related activities 	<ul style="list-style-type: none"> Regular involvement in teaching-related committees, programs, or activities

Departments as Incubators to Adapt, Use and Refine the Rubric



National Programs focused on Teaching Evaluation, as well as institutional efforts



Issues Looking Forward

- Developing a shared vision (definition) of effective teaching (that includes the intellectual work involved)
- Developing frameworks, methods, and measures to document and evaluate all aspects of effective teaching
 - Consider targets of evaluation (e.g., learning, progress)
 - Develop a suite of multiple measures
- Scaffolding for practical implementation and scaling
- Incorporating issues of diversity and inclusion

Issues Raised by COVID-19

- COVID-19 is a dramatic disruption to the higher ed context
- Higher ed will be changed permanently
- The COVID-19 context is amplifying some drivers of the *pre-COVID* surge of interest in improving teaching evaluation

Drivers of Interest in Improving Teaching Evaluation

Faculty investment in teaching & learning improvement

- As faculty adapt teaching to new contexts, we need a system that documents and rewards those efforts and supports evidence-informed improvement

Limitations of commonly-used methods

- Fear of student discontent with Spring 2020 helps more people see the need for input from other sources
- Wider use of online, asynchronous teaching methods underscores the need to capture a broader range of teaching dimensions (e.g., course & assignment design)

A More Comprehensive and Holistic Approach is Now Even More Important

A scholarly approach to teaching evaluation is a way to address those issues

It also enables us to externalize our vision and commitment to teaching effectiveness- commit to quality, and value and support faculty.

On the Future

- What resources would help you / your institution transform teaching evaluations?
- Where does this national discussion go next? What areas/ ideas to focus on?

You will shape next steps

- Sharing models, noting context
- Catalyzing institutional engagement
 - Internal approaches
 - External levers
- Sustaining changing

On To Breakout Groups...

- What resources would help you / your institution transform teaching evaluations?
- Where does this national discussion go next? What areas/ ideas to focus on?

Identify a reporter for <1 min and 1 idea per question

Report Outs

- Groups 1 -5 question 1
 - Share 1 idea on question 1: resources
 - One min or less, please
- Groups 5-1, question 2
 - Share one idea on question 2: national discussion
 - One min or less, please

Information about BOSE & BOSE projects including
the Roundtable:

<https://www.nationalacademies.org/bose/board-on-science-education>

Ideas or suggestions
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Save The Date for a
Symposium on Imagining the Future of
Undergraduate STEM Education-
November 12-13, 2020
Washington D.C. and/or a virtual format