Adopting & Implementing Evidence-based Teaching Strategies Online

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Slides: bit.ly/ebtonline & Canvas Course
Why Explore this Topic?

There are calls nationwide in discipline-specific professional organizations and colleges and universities to adopt evidence-based teaching strategies & technologies to improve student success & graduation rates.

**Evidence-based teaching strategies** = strategies for which there is research support for their effectiveness & positive impact on student success, equity, attitudes...

There are potential barriers and challenges to adopting evidence-based teaching techniques or technologies, however...
Challenges for Evidence-Based Teaching

- Most research on evidence-based teaching strategies is in the context of face-to-face courses only, not online courses. Examples:
  - Peer Instruction, Flipping the Classroom
  - Team-based Learning (but see TBL online)
  - Problem-based Learning, Service Learning
  - Classroom Response Systems - Kahoot, Poll Everywhere
- Most instructors don’t have the time to keep up with educational research articles, and even if you do, it’s not always clear how to implement the strategies. Could use some concrete examples.
Challenge - Improving Student Success & Equity

- Raising the average “student success” isn’t good enough, especially if it widens equity or achievement gaps.

On the left, achievement gaps widen, on right, the gaps are closed.
### Barriers & Drivers to Instructional Innovations

<table>
<thead>
<tr>
<th>Example Barriers (18 total)</th>
<th>Example Drivers (15 total)</th>
</tr>
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<tbody>
<tr>
<td>Time, Competes with Research</td>
<td>Improves Teaching and Assessment</td>
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<tr>
<td>Instructional Challenges, Content Coverage</td>
<td>Promotes Student Engagement &amp; Faculty-Student Interaction</td>
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<td>Perceived Loss of Autonomy</td>
<td>Develops Stronger Students/Graduates</td>
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<tr>
<td>Insufficient Resources, Support</td>
<td>Enhances Teaching Satisfaction</td>
</tr>
<tr>
<td><strong>Student Resistance</strong></td>
<td>Increased Research Opportunities (SoTL)</td>
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*Via “Faculty drivers and barriers: laying the groundwork for undergraduate STEM education reform”*
What are we looking for? Some Criteria

Teaching strategies that:

- Have research evidence indicating a positive and lasting impact on student achievement, attitudes, self-efficacy, social belonging, etc. and ideally narrow or eliminate achievement and equity gaps.
- Can be used in online courses and face-to-face modalities
- Are simple and easy to implement (in some cases, pre-built in Canvas Commons)
- Are relatively brief and do not require redesigning a course

A non-comprehensive list of some strategies follows...
Share Your Experience

What are some strategies you’ve used in your courses to help increase student success, satisfaction, equity, etc.? 
Student Testimonials

(Social-Belonging Intervention)

Examples in Evidence-Based Teaching Canvas Sandbox
You have to research stuff you don’t understand by yourself, and, and things like that.

From Alex Penn. More examples in the Evidence-Based Teaching Strategies Sandbox
U. Houston - Realistic Job Preview

REAL UHD STUDENTS

Via “Realistic job preview as an alternative to student readiness for online learning surveys”, OLC 2018
Wisdom Wall - Using VoiceThread

by Michelle Pacansky-Brock: https://voicethread.com/myvoice/thread/5304832
Sample Freshmen Letter: College Success Course

Dear freshmen of ERAU,

I am currently a student at Embry-Riddle Aeronautical University, or ERAU, and I am majoring in Aerospace Engineering at this moment in time. This upcoming semester will be one of the hardest challenges you will face while here at this school. The reason I say this is because the transition from high school to college will be a tough thing to adjust smoothly too. There will be a lot of assignments given to you that will be expected to complete by a certain time. The lessons that are given to you by the instructor are done at a very fast pace to get all the material done. Pretty much eight or nine months of work is condense into around three months of work, which sounds unbelievable, but it is possible. The most important thing to do during this time span is to ask for as much help as you can when you are having trouble with the course. Through my personal experience I can that getting help is the best option. Sadly I did not do that and I ended up paying the consequences for that. The best options are to either go to the professor that is

Sample Student Testimonial: Online MOOC

“When I first started the course, I worried that I was different from the other students. Everyone else seemed so certain it was the right level for them and were so happy to take it. But I wasn't sure I fit in – if I would make friends, if people would respect me. Several days after I started, I came to realize that almost everyone who takes the course feels uncertain at first about whether they fit in. It's something everyone goes through. Now it seems ironic – everybody feels different at first, when really we're all going through the same things.” – Karen
Tips for Using Student Testimonials

- Provide some guidance to the students creating the testimonials
- Select a variety of students for testimonials to which students can relate
- **Just reading/watching testimonials is not enough**
  - Students may not even read them, or not think about them deeply and apply them.
  - Create an assignment, survey, or discussion in which students reflect on the testimonials
Writing Response Activity

Now consider why you think people's experience in an online course develops in the way the students described in the quotes. Why do they worry at first about whether they belong in the course? How did they become comfortable in it with time? Please write at least a paragraph. Focus on your thoughts and feelings, and don't worry about spelling, grammar, or how well written it is.
Sample Student Responses to Writing Activity

Maybe people worry at first about taking the course because they are afraid it will be difficult. For myself, I worried about belonging in the course, because I don’t usually study online without seeing or knowing the teacher. I'm afraid my experience and my skill are lower than other students’. [...] But, by practicing and speaking up to others when I faced problems, I became comfortable in it. Here I not only want to learn something, but I also want to make new friends.

Discussion forums are particularly intimidating because people have to put their questions out there for everyone to see and the first thought is that their questions will be seen as stupid.
Benefits for International Students

First experiment

- More-developed countries
- Less-developed countries

Persistence

Global gap

Course materials studied

Control  Social-belonging intervention  Affirmation intervention
Benefits for African American Students

From “A Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students”
Social-Emotional Interventions

● Values Affirmation
● Goal Setting
● Stress Reappraisal

Examples in Evidence-Based Teaching Canvas Sandbox
Values Affirmation Example

Below is a list of characteristics and values. Please select the 2 or 3 values or qualities that are most important to you.

- Artistic skills/aesthetic appreciation
- Sense of humor
- Relationships with family or friends
- Spontaneity/living life in the moment
- Learning for the sake of learning
- Creativity
- Business/managerial skills

How does taking this course reflect and reinforce your most important values?
Goal Setting Example

- What is your ideal future? What do you want to do?
- What are some qualities that you admire in other people?
- What are some things that you would like to learn more about?
- What are some habits that you would like to improve? (i.e., related to school, work, relationships, health).

Based on your above thoughts about the future and interests, please write 4-8 specific goals that you could pursue to achieve your desired future.

For each goal, provide an identifying label as well as a brief description of the goal itself.
Stress Reappraisal Example

When our bodies experience a stress response, our minds also produce an emotional response. In this way, the body and mind work together. But the emotional response we have depends in large part on the way we choose to interpret stress and arousal. If we interpret the physiological arousal state as negative, then we experience negative emotions like fear and threat. But if we choose to interpret physiological arousal as positive, then we experience positive emotions like excitement and anticipation.

- The body’s stress response is an adaptation—it leads to increased fitness.
- In humans, peak performance usually occurs when a positive emotional state co-occurs with an aroused physiological state.
Benefits for International Students

- More-developed countries
- Less-developed countries

Persistence

Completion

Global gap

Completion rate (%)
Value Affirmation
Reduced Achievement Gap
Effect of Goal Setting on GPA

Figure 1. Group differences in grade-point average (GPA) change postintervention.
Stress Reappraisal Improved Exam Scores

- Test anxiety (pre-intervention) → Intervention → Test anxiety (post-intervention)
- Intervnetion → Exam points → Non-exam points
- Gender gap → Exam points

Hypotheses:

- H₁: males < females
- H₂: reduces
- H₃: lowers
- H₄: males > females
- H₅: increases
- H₆: reduces
- H₇: No Δ if low TA
- H₈: no change
Why do these brief interventions work?

**Testimonials** - Hearing from your peers - you trust and learn more from someone who recently learned what you are learning. Peers remember being a novice, making mistakes. Learning from peers is key to the success of many instructional strategies: peer instruction, team-based learning, etc.

**Values/Goals** - Self-affirmation theory (Claude Steele). Armors you against:

- negative stereotypes (stereotype threat)
- lack of confidence (self-efficacy)
- stress (reducing defensive response)
- fixed mindset (belief that ability is innate)
Transparent Teaching Strategies

Examples in Evidence-Based Teaching Canvas Sandbox
Examples of assignments revised to be more transparent
Before:

Read through your example scientific poster and answer the following questions.

After:

**Purpose:** The purpose of this assignment is to analyze an existing scientific poster. This will increase your familiarity with how scientific posters are constructed, and will help you later in the course when you research, design, and create your own effective poster with sufficient scientific evidence that supports your conclusion. As a result of completing this assignment, you will be able to identify the sources of scientific information, interpret the results, and critically analyze the scientific merit of the conclusion of an existing scientific poster.
Research Results: Transparent Assignments

“students who received more transparency reported gains in three areas that are important predictors of students’ success:

- academic confidence,
- sense of belonging,
- and mastery of the skills that employers value most when hiring”

via “A Teaching Intervention that Increases Underserved College Students’ Success” (Winkelmes et al., 2016)
Transparent Assignments Benefit All Students

FIGURE 2. ALL DISCIPLINES/ALL STUDENTS IN LESS TRANSPARENT VERSUS MORE TRANSPARENT COURSES—END OF TERM

All Disciplines/All Students, End of Term

<table>
<thead>
<tr>
<th>Category</th>
<th>Less Transparent N=596</th>
<th>More Transparent N=587</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of Transparency</td>
<td>ES=0.70</td>
<td></td>
</tr>
<tr>
<td>Employer-valued Skills</td>
<td>ES=0.43</td>
<td></td>
</tr>
<tr>
<td>Academic Confidence</td>
<td>ES=0.35</td>
<td></td>
</tr>
<tr>
<td>Sense of Belonging</td>
<td>ES=0.43</td>
<td></td>
</tr>
</tbody>
</table>

KEY: N: number of students responding
ES: effect size (Hedges’ G). Effect sizes of 0.25 standard deviations or larger are “substantively important” (US Dept of Education WWC, 2014, p. 29).
Less Transparent: mean perceived transparency <3.3/4
More Transparent: mean perceived transparency ≥3.3/4

*Hart Associates 2015, 2013
Benefit First-Generation Students

FIGURE 3. FIRST-GENERATION COLLEGE STUDENTS IN LESS TRANSPARENT VERSUS MORE TRANSPARENT COURSES—END OF TERM

First-Generation College Students, End of Term

Amount of Transparency
ES=0.80
Less Transparent N=246
More Transparent N=188

Employer-valued Skills*
ES=0.58
Less Transparent N=245
More Transparent N=188

Academic Confidence
ES=0.50
Less Transparent N=242
More Transparent N=183

Sense of Belonging
ES=0.64
Less Transparent N=246
More Transparent N=188

KEY: N: number of students responding
ES: effect size (Hedges’ G). Effect sizes of 0.25 standard deviations or larger are “substantively important” (US Dept of Education WWC, 2014, p. 23).
Less Transparent: mean perceived transparency <3.3/4
More Transparent: mean perceived transparency ≥3.3/4

*Hart Associates 2015, 2013
Benefit Underrepresented Students

FIGURE 6. UNDERREPRESENTED STUDENTS (NON-WHITE), IN LESS VERSUS MORE TRANSPARENT COURSES—END OF TERM

Underrepresented Students (Non-White), End of Term

- **Amount of Transparency**
  - ES = 0.62
  - Less Transparent: N = 359
  - More Transparent: N = 343

- **Employer-valued Skills**
  - ES = 0.33
  - Less Transparent: N = 371
  - More Transparent: N = 265

- **Academic Confidence**
  - ES = 0.32
  - Less Transparent: N = 353
  - More Transparent: N = 246

- **Sense of Belonging**
  - ES = 0.34
  - Less Transparent: N = 359
  - More Transparent: N = 253

**4-Point Scale**

**5-Point Scale**

**KEY:**
- **N:** number of students responding
- **ES:** effect size (Hedges’ G). Effect sizes of 0.25 standard deviations or larger are “substantively important” (US Dept of Education WWC, 2014, p. 23).
- **Less Transparent:** mean perceived transparency < 3.3/4
- **More Transparent:** mean perceived transparency ≥ 3.3/4

*Hart Associates 2015, 2013*
Benefit Low SES Students

FIGURE 7. LOW SOCIOECONOMIC STATUS STUDENTS (BOTTOM QUARTILE), IN LESS VERSUS MORE TRANSPARENT COURSES—END OF TERM

Low Socioeconomic Status Students (Bottom Quartile), End of Term

- **Amount of Transparency**
  - **Less Transparent**: N=283
  - **More Transparent**: N=207
  - ES=0.67

- **Employer-valued Skills**
  - **Less Transparent**: N=283
  - **More Transparent**: N=207
  - ES=0.40

- **Academic Confidence**
  - **Less Transparent**: N=279
  - **More Transparent**: N=200
  - ES=0.39

- **Sense of Belonging**
  - **Less Transparent**: N=283
  - **More Transparent**: N=207
  - ES=0.34

4-Point Scale

5-Point Scale

KEY: N: number of students responding
ES: effect size (Hedges’ G). Effect sizes of 0.25 standard deviations or larger are "substantively important" (US Dept. of Education WWC, 2014, p. 23).
Less Transparent: mean perceived transparency <3.3/4
More Transparent: mean perceived transparency ≥3.3/4

Nudges

Examples in Evidence-Based Teaching Canvas Sandbox
What is Nudging?

- Design is never neutral.
- “uses low-cost, low-touch interventions to encourage, but not require, people to take a particular action. Putting healthy food at eye level in the cafeteria is a nudge. So is having employees opt out of, rather than into, a retirement-savings plan.” (Supiano, 2019).
- Designing online courses that incorporate strategies to influence student choices and behaviors.
Types of Nudging in Online Courses

**Feedback Nudges**
- "Be like others" nudge
- "Keep doing the good things that you're doing" nudge
- "You're making progress" nudge
- "I'm a learner" identity nudge
- Targeted nudging

**Design Nudges**
- Due dates and times nudge
- Initial entry
- Scheduled communications
Typology of nudging interventions (Damgaard & Nielsen, 2018)

Changes to decision environment
- Defaults
- Framing
- Peer group manipulations

Additions to decision environment
- Informational nudges
- Assistance
- Boosting skills
- Deadlines
- Goal setting
- Reminders
- Social comparison nudges
- Extrinsic motivation
- Social belonging, identity activation and mindset nudges
Canvas X: Nudge, August 2018

Canvas X is where we seek your input on experiments from our secret pandaworks lab!
It's all about starting small, measuring, and learning our way forward!
“Message Students Who” in Canvas Gradebook

Message students who...
for Sample Transparent Assignment Template

- Haven't submitted yet
- Haven't submitted yet
- Haven't been graded
- Scored less than
- Scored more than
- No submission for Sample Transparent Assignment Template

Message:

[Send Message]
Example Post-Exam Message

As a reminder, to improve exam performance, you should actively test yourself on the stated learning goals as you study. Specific recommended actions include the following:

- Attempt to “do” each learning goal by generating your own explanations.
- Consult course resources (notes, reading, homework, sample problems and solutions) in a targeted manner, to improve your ability with a specific learning goal. Do not simply reread.
- Match available assessments (e.g., clicker questions, practice questions, homework problems) to specific learning goals, and test yourself on all of those items by creating your own responses before looking at answers. Imagine alternate ways to test the goal, and test yourself with your own (or other students’) questions.
- Attend weekly (optional) problem solving sessions (Course A only).
Hi Mike! I'm your trusty college guide. Applying to college can be tough, but I'm here 24/7. Do you have any questions?

What's the FAFSA?

The FAFSA is an application for Federal Student Aid in the form of grants, loans, and work-study funds. It also helps determine how much financial aid you qualify for.
Interaction effects with gender and time (week)

Results: Email or Meeting w/Struggling Students

Comparison of exam performance and gains among the meeting intervention groups, e-mail intervention groups, and all other students for Course A and Course B.
Midterm Student Feedback

More Info in Evidence-Based Teaching Canvas Sandbox
What is Midterm Student Feedback?

Midterm Student Feedback (MSF) involves collecting feedback from students near the start or middle of a course in order to give the instructor an opportunity to make adjustments and improvements.

Usually an outside consultant such as an instructional designer collects the feedback and provides guidance for the instructor on translating the feedback into positive changes in the course.

The entire process is confidential to the instructor and anonymous for the students.
Why Not Stick to Just End-of-Course Evals?

There are several issues with traditional, end-of-course student evaluations:

- It is too late to make changes and improvements to a course.
- Students and instructors may not take it as seriously.
- There is no one to help instructors translate student feedback into actions/changes.
- Concerns with gender and racial bias. (See these research papers & summaries)
- There is usually a low response rate, meaning the feedback is less representative of the class as a whole.
- Student ratings may not correlate or even negatively correlate with learning and success in future courses.
- Faculty report an “overwhelming dissatisfaction with student evaluations” and an “unmet desire for greater guidance and assessment data to inform pedagogical decision making” (Brickman et al., 2016)
Example MSF Questions

Clark & Redmond, 1982
- What do you like about the course?
- What do you think needs improvement?
- What suggestions do you have for bringing about those improvements?

Simmons College, Florida Poly, and others
- What do you like most about this course and/or the instructor’s teaching of it?
- What about this course and/or the instructor’s teaching of it needs change or improvement?
- What suggestions can you offer that would help make this course a better learning experience for you?

U. Mich CRLT
- What are the major strengths in this course?
- What changes could be made in the course to assist you in learning?
Example MSF Questions

Ball State
- What about the class best helps you learn?
- What changes could the instructor make to improve your learning? [please frame with “The instructor should. . .”]
- **What can you—as a student—do to improve learning in this course?**

American University - Egypt
- What helps you learn in this course? (e.g. readings, discussions, assignments, teaching strategies, etc...) Please explain.
- What can be done to improve the class during the second half of the semester?

U. Dayton
- What is helping your learning in this class?
- What is hindering your learning in this class?
- What suggestions do you have to improve the learning in this class?
Benefits of Midterm Student Feedback

- Increases student learning, enjoyment, and course ratings (Overall & Marsh, 1979).
- Students and faculty consider it more effective than other techniques such as class observations or surveys with no consultation (Clark & Redmond, 1982; Finelli et al., 2008; Finelli et al., 2011; Diamond, 2004; Kulik, 2001).
Example Research Results

Figure 1. Improvement in student ratings by intervention group.

Group 3a
SGID, no ratings
MSF: A Win-Win-Win for Faculty, Students, and Us

**Instructors:**
- Receive valuable feedback from students and a teaching expert/consultant while there is still time to make changes
- Receive guidance on how to translate feedback into actionable changes in the classroom
- Improve the student learning experience
- Increase enjoyment and course ratings
- Receive opportunity to reflect on their teaching practices
- Increase student-teacher interaction and partnership
- Allow students to see instructor as a human being who cares about their learning

**Students:**
- Get a voice in their course
- Identify changes that can improve their experience in the course
- Chance to reflect on their own learning

**Faculty Developers:**
- Make an impact on teaching practices
- Build stronger partnership with faculty
- Analyze common teaching practices and issues at the school
- Evaluate information that is useful for planning and offering sessions and services
Discussion Boards: Protocols, Thematic Analysis, Video Discussions

Examples in Evidence-Based Teaching Canvas Sandbox
Example: Save the Last Word for Me

"One example of a protocol is called Save the Last Word for Me, in which half the students find a quote from a complex reading, which requires further interpretation from the class. Then, everyone provides their interpretation of at least two quotes posted. At the end of the week, the initial posters of the quote explain what they learned from the discussion. Then, the roles reverse for the next reading."

Via “Strategies for Creating a Community of Inquiry through Online Asynchronous Discussions” (Chen et al., 2017)
Example: Tuning Protocol

For this group discussion posting, I would like you to use a specific structure called a “Tuning” protocol. The Tuning process allows for reflection and meaningful feedback about your Business Model, and will likely result in your creating a better business model, and earning a better grade, too. This structure assumes that you want to improve your business model, and that your Bazinga Circle members will deliver thoughtful and substantive feedback. Think of it like tuning up a car or an orchestra. Your communal goal is to help each other make A’s on this assignment, so do this early in the week so you can use their feedback to improve your success on your assignment. There are three parts to this discussion structure: Parts A, B, and C.
Thematic Analysis

Read your colleagues' responses for the last online discussion and submit an analysis in which you note 3 themes:

- Label the themes.
- Explain each theme.
- Give 2 examples from the discussion for each theme - these are exact quotes from your student-colleagues.

Via "Student Responsible Learning: Getting Students to Read Online Discussions" (Stearns, 2017)
Video Discussion Board: FlipGrid

Using FlipGrid in Canvas

Blog Post created by Doug Holton on Sep 27, 2019

Like • 4  Comment • 7
Discussion
What Strategies Will You Adopt?

What strategy or strategies interested you the most? How will you adapt it to your courses?

- Student Testimonials
- Values Affirmation
- Goal Setting
- Stress Reappraisal
- Transparent Assignments
- Nudges
- Midterm Student Feedback
- Discussion Protocols
- Others?
Spreading the Word

What are ways we can spread the word about evidence-based teaching strategies? Explicit strategies, Implicit/Tacit Strategies
(example: incorporating strategies in an online course template)
Thank You!

Slides: [bit.ly/ebtonline](bit.ly/ebtonline) & [Canvas Course](Canvas Course)
Evaluate Sessions and Win!

- Download and open OLC Conferences mobile app
- Navigate to specific session to evaluate
- Select “Evaluate Session” on session details screen (located under session type and track)
- Complete session evaluation*

*Each session evaluation completed (limited to one per session) = one contest entry

Five (5) $25 gift cards will be awarded
Must submit evals using the OLC Conferences mobile app or website