Enlightened educators look to education research for well-founded evidence to help them do a better job with the children they serve.
Slavin (2004, p. 27)

Course Description
In a federally-mandated era of “evidence-based” education, what works in K-12 education? How do we know what works, and what does not? What does research show about which aspects of the classroom and school (other than content and curriculum, or what is taught) have a meaningful impact on student growth, learning, and achievement? We will consider topics such as class size, ability grouping and tracking, school start times, summer school, homework, direct instruction, problem- and project-based learning, personalized learning, and teacher education.

Course Goals
This course is designed to provide you with opportunities to:
- construct a knowledge base about evidence-based practices in education, and
- develop and use skills involved in the critical analysis of research to identify, recognize, and evaluate evidence-based practices in education.

Required Reading
- All of the assigned readings for the course will be available electronically through links on the Canvas site for the course.
- All readings listed in the syllabus are required reading for the course.

General Requirements
- All students are expected to read the material indicated in the Schedule and Reading List by Class below before each class and be prepared to discuss that material in class.
- All students are expected to attend class regularly (including x-hours), on time, and each student is responsible for all material presented and discussed in every class. If you must miss a class, it is your responsibility to borrow the notes from another student,
acquire any materials that were handed out, and learn if changes have been made to the syllabus.

- I recognize that some students may wish to take part in religious observances that fall during this academic term. Should you have a religious observance that conflicts with your participation in the course, please meet with me early in the term to discuss appropriate accommodations.
- All students are expected to uphold all aspects of the Academic Honor Principle (refer to http://www.dartmouth.edu/~uja/honor). Please make sure that you are familiar with the Honor Principle, including that all work should be your own and properly cited, and make sure to ask questions if you are uncertain about how it applies in this course. Any violation of the Academic Honor Principle regarding your work in this course will result in a zero on the assignment and referral to Judicial Affairs.

**Resources**

- I recognize that the academic environment at Dartmouth is challenging, that our terms are intensive, and that classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including: your undergraduate dean (http://www.dartmouth.edu/~upperde/), Counseling and Human Development (http://www.dartmouth.edu/~chd/), and the Student Wellness Center (http://www.dartmouth.edu/~healthed/). I encourage you to use these resources, and come speak with me, to take care of yourself throughout the term.
- Students with disabilities who may need disability-related academic adjustments and services for this course are encouraged to see me privately as early in the term as possible. Students requiring disability-related accommodations must consult the Student Accessibility Services (SAS) office (Carson Hall, Suite 125, 603.646.9900, Student.Accessibility.Services@Dartmouth.edu). Once SAS has authorized services, please share with me the SAS Services and Consent Form so that we can implement appropriate accommodations in the course. As a first step, if you have questions about whether you qualify to receive academic adjustments and services, contact the SAS office. All inquiries and discussions will remain confidential.
- If you feel that your learning is not as efficient or effective as you would like it to be, come talk with me about approaches to this course and consider using the resources available at the Academic Skills Center (https://students.dartmouth.edu/academic-skills/about/about-asc/services).
- If you would like to further develop your research and writing skills as you work on your research project, consider taking advantage of the services offered at the Student Center for Research, Writing, and Information Technology (RWIT, http://writing-speech.dartmouth.edu/learning/rwit).

**Assignments**

You have one out-of-class assignment for the term: a research project. Components of the project are due throughout the term, and build on each other – so (1) be careful not to fall behind, and (2) use feedback on earlier components to strengthen later components. No
late assignments will be accepted. The components will coalesce into a final presentation and paper. The components of the research project are:

1. Topic options (3 points; Wednesday, 16 January)
   Choose two aspects of a K-12 classroom or school (preferably not student-based or content-based) that you think might have an impact on student learning and achievement. Your ideas can come from multiple sources; for example, your own experiences as a student, discussions with others, or web searches. Describe each topic option in two or three sentences, and comment briefly (in two or three sentences) about why you are interested in each option.

2. First research evidence (6 points; Wednesday, 23 January)
   For each of your two topic options, find one relevant, recent, primary source, peer-reviewed research article. For each article, provide an APA-style reference and address the following:
   - What was the authors’ question?
   - What did the authors do to answer that question? Provide details, in your own words, about: study participants (e.g., who? what grade(s)? how many?), study design (e.g., was there a control group? what were the conditions?), and tasks and measures (e.g., exactly what was measured and how?)
   - What did the authors find? Provide details about the results in your own words.
   - How did the authors interpret the results?
   - How do you interpret the results?
   - What are some important limitations of the study? (e.g., what about the study gives you pause or makes you question the findings or interpretation of the findings?)

   In addition to submitting your bibliography entries, submit the first page of each article in one pdf file.

3. Topic choice (2 points; Friday, 01 February)
   After conducting further research (e.g., to get a sense of the viability of each topic option) and reflecting (e.g., is this still an interesting topic to you?), choose one of your two topic options to focus on for the remainder of the term. Provide a one-paragraph justification for your final topic choice.

4. Summary research evidence (10 points; Wednesday, 13 February)
   Find and critically analyze evidence (see #2) from at least nine additional peer-reviewed articles directly relevant to your topic choice. These articles must be modern, primary source, peer-reviewed research articles or peer-reviewed meta-analyses, and should reflect a representative sample of what is available in the literature (i.e., if there is evidence both for and against, include articles representing both views and critically evaluate). Your summary will take the form of a specialized annotated bibliography with at least ten entries. In
addition to submitting your bibliography, submit the first page of each referenced article combined into one pdf file.

5. Lightning talk (10 points; Friday, 01 March/Monday, 04 March/Wednesday, 06 March)
Prepare a 5-minute presentation summarizing and synthesizing your evidence base and provide critical analysis leading to a conclusion about the impact of your topic choice on student learning and achievement. Be sure to practice your talk before you present in class, as you will be strictly limited to 5 minutes. You will be randomly assigned to present on one of the three days of our mini-conference. Your final presentation is due by 8:00 am the day of your presentation. Submit your presentation through Canvas assignments with file name [first name_last name_talk]. I will compile all of the presentations for the day in one place for efficient transitions during our mini-conference.

6. Final paper (15 points; Friday, 08 March)
Your final paper summarizing and synthesizing your evidence base and providing critical analysis will take the form of brief white paper for K-12 teachers, administrators, and policy-makers. Given the evidence that you have presented and carefully reviewed and synthesized, what is your determination about whether your topic choice has a meaningful impact on student learning and achievement? Based on your evidence, argue persuasively why it is worthwhile (or not) to implement in K-12 schools or classrooms, noting any caveats or limitations.

**Quizzes**
There will be unannounced quizzes on random class days throughout the term. These will be brief (< 5-minute) assessments at the beginning and/or end of class, based on the materials for the day.

**Exams**
There will be two midterm exams (10 points and 12 points) and one final exam (16 points). Each will be cumulative, and will address information from both class and the assigned readings. Each may involve multiple choice, fill-in-the-blank, and/or short-answer questions.

**Canvas (https://canvas.dartmouth.edu)**
Class resources can be found on the Canvas site for the course, including a copy of the syllabus and course reading links. You will submit assignments through the assignments function.

**Course Grade**
Course grades are based on class participation (6%); grades on quizzes (10%); grades on the project components (summing to 46%); and grades on the first midterm exam (10%), the second midterm exam (12%), and the final exam (16%).
## Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>What to Read</th>
<th>What's Due</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week One</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 07 January</td>
<td>Introduction</td>
<td>Syllabus, Canvas site</td>
<td></td>
</tr>
<tr>
<td>W 09 January</td>
<td>Evidence-based education</td>
<td>Davies, Goldacre, Smith, Bridgeland, USDoe</td>
<td></td>
</tr>
<tr>
<td>F 11 January</td>
<td>Evidence-based education</td>
<td>Sousa, Brookman-Byrne, Slavin, Kamenetz, Killian, APA</td>
<td></td>
</tr>
<tr>
<td><strong>Week Two</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 14 January</td>
<td>Evidence-based education</td>
<td>Seals, Gastel, APA, Leo</td>
<td></td>
</tr>
<tr>
<td>W 16 January</td>
<td>Class size</td>
<td>EEF, Woods, Mathis, CCSSO, Blatchford</td>
<td>Topic options</td>
</tr>
<tr>
<td>F 18 January</td>
<td>Ability grouping &amp; tracking</td>
<td>EEF, Haskell, Kohli, Barrington, Loveless, Olszewski-Kubilius</td>
<td></td>
</tr>
<tr>
<td><strong>Week Three</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 21 January</td>
<td>Martin Luther King, Jr. Day</td>
<td>[no classes]</td>
<td></td>
</tr>
<tr>
<td>*T 22 January</td>
<td>Start times</td>
<td>ASWG, Edwards, Jacob, Shapiro, Wahlstrom</td>
<td></td>
</tr>
<tr>
<td>W 23 January</td>
<td>Suspending</td>
<td>CSH, Massar, Loveless, Steinberg, Okonofua</td>
<td></td>
</tr>
<tr>
<td>F 25 January</td>
<td>Career academies</td>
<td>EEF, Quinn, Miller, ECS</td>
<td></td>
</tr>
<tr>
<td><strong>Week Four</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 28 January</td>
<td>Midterm Exam One</td>
<td>IES, ACTE, Stern, Hoye, Anderson</td>
<td></td>
</tr>
<tr>
<td>W 30 January</td>
<td>Direct instruction</td>
<td>[no assigned reading]</td>
<td></td>
</tr>
<tr>
<td>F 01 February</td>
<td></td>
<td>Cantine, Clark, Peterson, Moore, Chase, Schneider, Sondel</td>
<td></td>
</tr>
<tr>
<td><strong>Week Five</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 04 February</td>
<td>Collaborative learning</td>
<td>EEF, Chen, Vega, Johnson, Cain, Godsey, Addison</td>
<td></td>
</tr>
<tr>
<td>*T 05 February</td>
<td>Midterm One returned</td>
<td>William, ASfEBT, Schwartz, Saaris, Stenger, Pershan</td>
<td></td>
</tr>
<tr>
<td>W 06 February</td>
<td>Feedback</td>
<td>[no assigned reading]</td>
<td></td>
</tr>
<tr>
<td>F 08 February</td>
<td>Flipped classroom</td>
<td>Fritz, Fulton, Morgan, Goodwin, Moran, DeLozier</td>
<td></td>
</tr>
<tr>
<td><strong>Week Six</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 11 February</td>
<td>Competency-based learning</td>
<td>CW, Anand, Spencer, Lopez, Riccards, Robbins</td>
<td></td>
</tr>
<tr>
<td>*T 12 February</td>
<td>Problem- and project-based learning</td>
<td>David, Bell, Dole, Duke, Larmer</td>
<td></td>
</tr>
<tr>
<td>W 13 February</td>
<td>Personalized learning</td>
<td>Bulger, Herold (2), Walker, Yu, Riley</td>
<td>Summary evidence</td>
</tr>
<tr>
<td>F 15 February</td>
<td>Homework</td>
<td>Loveless, Barnum, Weir, Terada, Horrigan, Willingham, Vatterot</td>
<td></td>
</tr>
<tr>
<td><strong>Week Seven</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 18 February</td>
<td>Midterm Exam Two</td>
<td>[no assigned reading]</td>
<td></td>
</tr>
<tr>
<td>W 20 February</td>
<td>Teacher education</td>
<td>Jang, AACTE, Cochran-Smith, Hanford, Economist, Walsh</td>
<td></td>
</tr>
<tr>
<td>F 22 February</td>
<td>Alternative programs: TFA</td>
<td>Albina, IES, Loewus, TFA (2), Schneider, Higgins</td>
<td></td>
</tr>
<tr>
<td><strong>Week Eight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 25 February</td>
<td>Professional learning</td>
<td>Pierce, Barnum, Hanford, Teitel, Darling-Hammond (2)</td>
<td></td>
</tr>
<tr>
<td>*T 26 February</td>
<td>Midterm Two returned</td>
<td>[no assigned reading]</td>
<td>Lightning talk</td>
</tr>
<tr>
<td>W 27 February</td>
<td>21st century teaching</td>
<td>Rich, P21, Rotherham, Kereluik, Livingstone</td>
<td></td>
</tr>
<tr>
<td>F 01 March</td>
<td>Data blitz mini-conference</td>
<td>[no assigned reading]</td>
<td></td>
</tr>
<tr>
<td><strong>Week Nine</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 04 March</td>
<td>Data blitz mini-conference</td>
<td>[no assigned reading]</td>
<td>Lightning talk</td>
</tr>
<tr>
<td>W 06 March</td>
<td>Data blitz mini-conference</td>
<td>[no assigned reading]</td>
<td>Lightning talk</td>
</tr>
<tr>
<td>F 08 March</td>
<td>Conclusion</td>
<td>Weston, Hunter, Kane</td>
<td>Final paper</td>
</tr>
<tr>
<td><strong>Final Exams</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-15 March</td>
<td>XX Final Exam</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*note that the Schedule is subject to change  †see detailed list below
Reading List by Class

The assigned readings listed below should be completed before each class. The readings were carefully chosen to help you establish background knowledge and familiarity with key concepts and issues, a basic foundation upon which class will build each day. Links to the readings are available within this syllabus and on the Canvas site for the course. You may need to copy-and-paste some links into your browser. If a link returns a page of nonsense in your browser window, highlight (double-click on) the address in your browser and hit return. If a link should fail, use Google or search the Dartmouth Library to locate the reading.

Week One

Monday, 07 January – Introduction to the Course
An overview of the course content, structure, and requirements and an introduction to the course.

› Syllabus
› Canvas site for the course

Evidence-based Education: The Basics

Wednesday, 09 January – Evidence-based Education (part 1)
An introduction to the concept of evidence-based education. Current federal education law (the Every Student Succeeds Act, ESSA) emphasizes the use of evidence-based practices in public K-12 education, but the discussion about using evidence in education is decades old. What are the pros and cons? What are the alternatives? What are the challenges and benefits?

Friday, 11 January – Evidence-based Education (part 2)
We consider the nature of evidence in evidence-based education. We will discuss kinds of research and publications, peer review, determining “what works” based on effect sizes, the What Works Clearinghouse (WWC), and reporting conventions, including APA style. We will also spend a bit of time with Hattie’s influential work, marked by the publication of the book Visible Learning in 2009.

- APA Style Sheet

Week Two

Monday, 14 January – Evidence-based Education (part 3)
We focus on finding and analyzing the evidence in evidence-based education. Readings address details of the peer review process, which involves critical analysis of a manuscript similar to the careful analysis of a published article by a critical reader (i.e., information that you will use as you critically analyze articles for your project). In class, we will discuss how to find peer-reviewed research articles reliably, and practice critically analyzing a research article.

Monday, 15 January – Class Size

Today, we begin our exploration of structural design aspects of the school and classroom by looking at class size. Is class size related to student achievement in any systematic way? Do K-12 students in smaller (or larger) classes learn more or better? The research evidence suggests a complicated story, despite a strong class-size reduction (CSR) movement.


Friday, 18 January – Ability Grouping & Tracking

Ability grouping and tracking, both ways of dividing students into smaller instructional groups, are common practices in US public schools (e.g., were you in the bluebirds reading group in first grade? were you on the honors or AP or college prep track in high school?). Today, we consider whether the research evidence supports the use of these practices to improve the achievement of all students.


---

**Monday, 21 January – Martin Luther King, Jr. Day [no classes]**

*Tuesday, 22 January – Start Times*

The basic school start time argument is that, given what is known about the biology of sleep in adolescents, start times should be shifted later for middle and high schools in order to improve student learning. The scientific evidence is abundant and clear. But what happens when the research evidence meets the practicalities of the real world?

**Wednesday, 23 January – Suspensions**

As might be expected, evidence shows that there are negative consequences to suspensions—academic and otherwise. Are there viable, evidence-based alternatives to using exclusionary practices to respond to unacceptable behaviors in schools?


**Friday, 25 January – Summer School**

Does attending summer school improve learning and achievement for all students? What is at stake? Much of the current discussion about the effects of summer school concerns the idea of “summer slide.”

Week Four

Monday, 28 January – Career Academies
Career academies, based on a “school-within-a-school” concept developed decades ago, are one example of an approach to career and technical education (CTE). Is there evidence to support career academies as a way to enhance learning and achievement? What are the pros and cons?


Wednesday, 30 January – Midterm Exam One

Friday, 01 February – Direct Instruction
Today, we begin our exploration of approaches within the classroom, starting with direct instruction. “Direct instruction” comes in many forms, but is essentially explicit, structured, instructor-guided teaching. From the launch of Direct Instruction in Project Follow Through in the late 1960s to debates about scripted lesson use in charter schools and approaches to science learning today, direct instruction is a controversial topic. We consider some of the arguments and evidence for and against. As always, please carefully consider the sources as you read for today.


---

**Monday, 04 February – Collaborative and Cooperative Learning**

Collaborative and cooperative learning come in many different forms, but essentially involve students working together in order to learn. Decades of research suggest that collaboration is a powerful learning tool when used carefully, and some research-based guidelines have been established. However, whether all students benefit remains controversial.


_2013_The_impact_of_cooperative_competitive_and_individualistic_learning_environments_on_achievement_In_J_Hattie_E_Anderman_Eds_International_handbook_of_student_achievement_372


**Tuesday, 05 February – Midterm One returned**

**Wednesday, 06 February – Feedback**
An example of formative assessment, feedback is a hallmark of both the Direct Instruction and collaborative/cooperative learning approaches. Can feedback improve learning, growth, and achievement? What does research show about the power of feedback, for both supporting and stunting learning? What guidelines for giving and receiving feedback have emerged from the research literature?


**Friday, 08 February – Flipped Classroom**
The flipped classroom is considered an example of “blended learning” because it relies on both via-technology and in-person instruction. For our purposes, it offers an example of a
different blend: of direct instruction and collaborative/cooperative learning. Despite the popularity of the phrase and the proliferation of anecdotal claims, there has been little quality research conducted regarding the utility of the flipped classroom model in K-12 education.


**Week Six**

---

**Monday, 11 February – Competency-based Learning**

This week, we look at four in-classroom approaches (not necessarily mutually exclusive) that focus on different levels of analysis for learning and teaching: competencies, problems and projects, and people. Some states, like New Hampshire, have shifted to a competency-based (also known as mastery-based, performance-based, or proficiency-based) education model in their K-12 public schools. What does this mean? What is the evidence to support such a shift?


*Tuesday, 12 February – Problem- and Project-based Learning*

Today, we consider what problem-based and project-based learning (PBL) are and what the research evidence shows about PBL and achievement in K-12 classrooms.


*Wednesday, 13 February – Personalized Learning*

With the proliferation of technological options, proponents claim that personalized learning – instruction specially tailored to each individual student, although a precise definition is lacking – is now possible in K-12 public school classrooms. Today, we consider what
personalized learning looks like in the classroom, current discussions about this approach, and potential pros and cons.


Friday, 15 February – Homework

We have spent the last few weeks exploring different in-classroom approaches to learning and teaching. Today, we look at classroom-related learning that is supposed to occur outside the classroom, through homework. The evidence base regarding the usefulness of homework and the relationships among homework and student growth, learning, and achievement is equivocal; grade level and content appear to be critical factors.

Week Seven

Monday, 18 February – Midterm Exam Two

Educating Teachers

Wednesday, 20 February – Teacher Education Programs (TEPs)
Today, we begin our brief exploration of the role of teachers’ learning in education. In an era of accountability, teacher preparation has become an increasingly controversial topic. How are teachers prepared and trained? What does the research evidence show: Does – or how does – teacher training matter? What are the best ways to train high-quality teachers who competently support student growth, learning, and achievement?

Friday, 22 February – Alternative Teacher Preparation Programs: Teach for America (TFA)

Continuing our discussion about teacher education, today we focus on TFA as an alternative program. Does research evidence indicate that TFA is effective (or as effective as traditional TEPs) in training teachers who competently support student growth, learning, and achievement? Is that the primary goal of TFA? Controversy surrounds this high-profile program; we will consider some of the key issues raised in the debates.


Monday, 25 February – Professional Development/Professional Learning

Professional development (PD) or professional learning (PL) is essentially continued education for practicing teachers. It may be one way of increasing implementation of evidence-based practices in education, but the evidence for the effectiveness of PD/PL itself is not strong. Today, we will learn about recent changes in federal law related to PD/PL, consider what research shows about what factors are associated with PD/PL effectiveness, and spend some time with specific examples: professional learning communities (PLCs), coaching, lesson study, and instructional rounds.


*Tuesday, 26 February – Midterm Two returned*

**Wednesday, 27 February – 21st Century Teaching and Learning**

In the US, the Partnership for 21st Century Skills (P21) has shaped discussion around the “new” 4 Cs (critical thinking, communication, collaboration, and creativity), competencies thought to be crucial to college and career readiness in this century. Information and communication technology (ICT) skills have also been highlighted as a necessary ingredient for success in the 21st century. But an evidence basis has been difficult to establish, in part because these sorts of claims tend to be ill-formed for research.


Your Discoveries

**Friday, 01 March – Data Blitz Mini-conference**
A “data blitz” at a professional conference is a series of lightning (5-minute) talks. Our data blitz mini-conference on evidence-based education and what works – and doesn’t – in education begins today. Each student will be randomly assigned to present on one of the three days of our conference.

**Monday, 04 March – Data Blitz Mini-conference**
Our mini-conference on what works in education continues.

**Wednesday, 06 March – Data Blitz Mini-conference**
Our mini-conference on what works in education concludes today.

**Conclusion**

**Friday, 08 March – Conclusion**
Wrap-up and reflection.

