Summaries or Relevant Research

--an amazing free resource with chapter summarizing much of the current research on learning with many chapters written by those doing the research and writing about it with accessible language and suggestions for implementing what the research has established

--clear descriptions of three group learning models; problem based learning, process-oriented guided inquiry and peer-led team learning. References relevant research and resources.


--The Freeman, et. al. meta-analysis, the largest statistical analysis of research on active learning clearly discusses it’s findings, however, the statistical methods used are difficult to understand for those without a statistical background. Allen has written a short, very clear summary of the research and its findings, which appears in an open access journal. Weiman’s commentary is also worth reading. It too offers an understandable summary with easier graphics, plus insightful and pointed comments. If you ever need to make the case for active learning or have colleagues that are still unconvinced, here’s the compelling evidence. Active learning wins!

--identifies 10 research-based learning principles that enhance long-term retention and transfer

--an excellent review of the research with special emphasis on evidence supporting active learning in the sciences

--a comprehensive and compelling analysis of the impact of active learning experiences
Research on Specific Learner-Centered Approaches

-- restructuring this large biology course “led to significant improvement of self-reported student engagement and satisfaction and increased academic performance.” (p. 203)

--50% of the lectures were replaced with POGIL activities, performed in class by students working collaboratively in small groups. Overall course scores increased from means of 76% to 89%.

-- found that most students’ problem-solving strategies and abilities can be improved by working in short-term collaborative groups

-- an experimental section using a variety of learner-centered approaches had better attendance, higher engagement and more than twice the learning than in the control section where the teacher lectured

-- students participating in weekly peer-led study groups out performed students not in study groups on three out of four measures of academic performance

-- substituted one lecture per week with a guide-inquiry discussion and found covering less content did not result in less learning

Essays Exploring Learner-Centered Issues

-- challenges the coverage model by proposing that students should be “doing” history in the survey course

-- explores the causes of student resistance and suggests good ways to address it
Singham, M. “Moving Away from the Authoritarian Classroom.” *Change*, May/June 2005, pp. 51-57. --finds the authoritarian language and structure of syllabi symptomatic of the breakdown of trust between teachers and students; describes his experience with a redesigned syllabus in a large physics course

Singham, M. “Death to the Syllabus.” *Liberal Education*, 2007, 93 (4), 52-56. --further analysis of the role of syllabi in preventing and promoting learning

Spence, L. D. “The Case Against Teaching.” *Change*, 2001, 33 (6), 11-19. --a kick-in-the-butt piece if something is needed to motivate change in the direction of learner-centered teaching

Whetten, D. A. “Principles of Effective Course Design: What I Wish I had Known about Learner-Centered Teaching 30 Years Ago.” *Journal of Management Education*, 2007, 31 (3), 339-357. --great advice on implementing learner-centered approaches starting with how the course is designed

**Implementation Experiences**

Albers, C. “Teaching: From Disappointment to Ecstasy.” *Teaching Sociology*, 2009, 37 (July), 269-282. --honors students resisted approaches that required them to be more self-directed


Prince, M., and Felder, R. “The Many Faces of Inductive Teaching and Learning.” *Journal of College Science Teaching*, 2007, 36 (5), 14-20. --illustrates how inductive methods (like inquiry- and problem-based approaches, among others) have been implemented in the sciences and identifies many helpful resources

Silverthorn, D. U. “Teaching and Learning in the Interactive Classroom.” *Advances in Physiology Education*, 2006, 30, 135-140. --uses a system that holds students responsible for learning some content on their own

Ueckert, C., Adams, A., and Lock, J. “Redesigning a Large-Enrollment Introductory Biology Course.” *Cell Biology Education—Life Sciences Education*, 2011, 10 (Summer), 164-174. --a major course redesign undertaken by a team of faculty resulted in a course where more students succeeded (measured by higher grades and fewer dropouts) and were more satisfied with this course which was offered in multiple sections

**Learner-Centered Strategies, Approaches and Assignments**

Benjamin, L. T. “Setting Course Goals: Privileges and Responsibilities in a World of Ideas.” *Teaching of Psychology*, 2005, 32 (3), 146-149 --sees a possible role for students in setting course goals or in sharing goals with the instructor

Cohen, D., Kim, E., Tan, J., and Winkelmes, M. “A Note-Restructuring Intervention Increases Students’ Exam Scores.” *College Teaching*, 2013 61 (Summer), 95-99. --evidence that supports students taking notes and an interesting way for students to engage with their notes

DiClementi, J. D. and Handelsman, M. M. “Empowering Students: Class-Generated Rules.” *Teaching of Psychology*, 2005, 32 (1), 18-21 --gave students a set of categories (late arrival, sleeping in class, use of cell phones) and let them develop classroom policies
--students review the material, not the teacher

--let student design the course syllabus by providing them with 50 possible course objectives and 22 potential assignments, and by stipulating the course design had to fit the course description

--after a telling assessment revealing just how few students were actually doing the reading, devised an interesting assignment which did as the title claims

--gives students a syllabus the only contains topical headings and charges them with constructing a list of graded assignments.

--analyzes reactions of students when they were given a choice of assignments to complete

--lets students have some control over how they will participate in class

--uses a reading journal assignment to have students reflect on their choice of reading strategies and introduces them to alternative strategies

--a creative assignment that involves students in correcting plagiarized work

--reports on experiences in a seminar where students selected discussion topics, led some of the discussions and completed loosely structured assignments

--students in an upper division biochemistry course generated questions from assigned reading, one question for each of 11 readings. The questions could not be factual but had to describe conceptual problems.

--assigned students to reading groups and assigned them tasks to be completed before coming to class

--insightful analysis of student reading skills and how they can be developed. Objects to quizzes and proposes an assignment that helps develop college level reading skills.

--get example of an assignment design that gets students doing the reading at the same time it develops college-level reading skills


--describes an assignment that gets students doing the reading before they come to class and participating in discussion during class

**Assessment Issues**


--uses a comprehensive lit review to generate the most common assessment criteria for peers; also includes two excellent peer assessment forms, plus much other useful information


--students write and answer their own test questions, and are graded on the content and difficulty of their questions


--some especially creative assessment techniques that respond constructively to exam anxiety


--tracks the evolution of a contract grading scheme across a four-year period with 473 students in 22 classes and at three different universities


--empirically investigated a method of having students record and describe their discussion contributions which showed that student did not over-reported their participation


--great collection of prompts that improve the quality of feedback students provide each other on papers, projects and presentations


--contains a carefully development instrument that can be used to assess member contributions in group work and good advice on using it


--found that letting students determine the weight of two major course grades reduced exam anxiety