Active Learning Annotated Bibliography

Subcategories:
- Global assessments of AL,
- Foundation/Clinical teaching,
- Classroom/basic science teaching

Adam, Maya, MD, Sharon F. Chen, MD, Manuel Amieva, MD, Jennifer Deitz, MA. The Use of Short, Animated, Patient-Centered Springboard Videos to Underscore the Clinical Relevance of Preclinical Medical Student Education, Academic Medicine: July 2017 Volume 92 - Issue 7 - p 961–965  (AL Clinical Application)

To link to this article: https://journals.lww.com/academicmedicine/Citation/2017/07000/The_Use_of_Short,_Animated_Patient_Centered.39.aspx

In this article, the authors identify a problem: first year students who do not understand the relevance of foundational courses to clinical experience during the clerkship years.

To help make those connections, the faculty worked with IT and AV resources to create 36 short, animated story boards authentic patient cases conveying foundational pathophysiology as part of a microbiology, immunology, and infectious disease curriculum. The student response was positive, 87% and 72% of two medical school populations rated them favorably. The group is looking to make the videos widely available, and are considering applications in undergraduate medical education and clerkship applications.


To link to this article: http://tguilfoyle.cmswiki.wikispaces.net/file/view/What_works,_What_doesn't.pdf

This article concisely and cogently reviews the results of 700 scientific articles on ten commonly used learning techniques. With rigorous criteria, they were able to identify two clear winners: self-testing and distributed practice. Also reviewed with less robust success are elaborative interrogation, self-explanation, and interleaved practice. Highlighting and rereading were rated ineffective and time consuming. Also faring poorly were summarization and keyword mnemonic. Short and well worth reading.

Freeman S, Eddy SL, Mcdonough M, et al. Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of
Scott Freeman et al metaanalyzed over 225 articles that reported data on examination scores or failure rates when comparing student performance in undergraduate science, technology, engineering, and mathematics (STEM) courses under traditional lecturing versus active learning. The studies analyzed here document that active learning leads to increases in examination performance that would raise average grades by a half a letter, and that failure rates under traditional lecturing increase by 55% over the rates observed under active learning.

Gullo, Charles, a Tam Cam Ha, a and Sandy Cook a. Twelve tips for facilitating team-based learning. *Med Teach.* 2015 Sep 2; 37(9): 819–824. (Global assessments of AL)

Practical article with salient tips for faculty who are facilitating TBL classes. The message is that facilitating can be learned though it may take practice. Revisiting these 12 tips would benefit anyone currently leading a TBL. Include in faculty packet on Active Learning?

Hagiwara, Nobuko. Application of active learning modalities to achieve medical genetics competencies and their learning outcome assessments. *Advances in Medical Practice,* 2017:8 817–829. (Global assessments of AL)

The author emphasizes the need for medical students to understand the eight EPAs of genomic medicine, given the growing role for all physicians to have basic skills in genetic/genomic medicines. The author then goes on to detail six active learning modalities he analyzed to test their disadvantages and efficacies. The modalities tested were 1. Role playing, 2. Standardized patients, 3. Computer-based models, 4. Case-based/ problem-based learning 5. Personal genomic testing, and 6. Cadaver genomic testing. The author did student surveys and multiple choice tests, but suggests that activity based assessments are needed as a measure of success. His objective is two-fold, to have new guidelines for EPAs for a required class on genomic medicine in medical school foundational education and to adopt active learning modalities that help teach the EPAs effectively. His descriptions of the purpose of each EPA and analysis of the active-learning instructional methods are easy to follow and thorough. (AL Clinical Application)
This study demonstrates that TBL and CBGD are equally effective active learning strategies when employed in a systems-based pre-clinical pathology curriculum, but students with lower academic performance may benefit more from TBL than CBGD.

Lambert, Craig. *Twilight of the Lecture: The trend toward "active learning" may overthrow the style of teaching that has ruled universities for 600 years.* *Harvard Magazine.* 23-28. 2012-03 *(AL Classroom/AL basic science teaching)*

To link to this article: [https://harvardmagazine.com/2012/03/twilight-of-the-lecture](https://harvardmagazine.com/2012/03/twilight-of-the-lecture)

This article should be required reading. In straight forward prose, it tells the story of Harvard physics professor Eric Mazur’s realization that “After a semester of physics, they still held the same misconceptions as they had at the beginning of the term. After “There’s also better retention of knowledge. “In a traditional physics course, two months after taking the final exam, people are back to where they were before taking the course,” Mazur notes. “It’s shocking.” “They had a bag of tricks, formulas to apply. But that was solving problems by rote. They floundered on the simple word problems, which demanded a real understanding of the concepts behind the formulas.” This leads to his seminal research in peer instruction and active learning. Ultimately a great illustration of teaching to achieve Blooms Taxonomy of higher order thinking.

Merritt, Chris, Munzer, Brendan W., Wolff, Margaret, Santen, Sally A. *Not Another Bedside Lecture: Active Learning Techniques for Clinical Instruction.* Volume 2, Issue 1 January 2018 Pages 48–50 *(AL Clinical Application)*

To link to this article : [http://onlinelibrary.wiley.com/doi/10.1002/aet2.10069/full](http://onlinelibrary.wiley.com/doi/10.1002/aet2.10069/full)

Besides the great title, this article offers practical advice for creating active learning moments in the fast-paced environment of Emergency Medicine. “Multiple frameworks, such as the One-Minute Preceptor and SNAPPs, have been developed for teaching and assessing clinical reasoning skills in time-sensitive environments, while a number of other discrete teaching tools have been proposed to augment these teaching schemas.[1, 4] Here, we describe three simple but powerful techniques that may be used in the EM workplace to create active learning moments. Used alone or within a broader framework, these techniques do not require preparation or significant time and may be adapted for a variety of clinical contexts to encourage contextualization of knowledge content, clarify difficult concepts, and improve bedside teaching. The article
is likewise brief, focusing on three active learning activities: Muddiest Point, Harvesting, and Thinking Hat. Clear with good graphics.


To link to this article: https://www.ncbi.nlm.nih.gov/pubmed/28840454

The gist of this article is that “Internal medicine clerkship directors believe that clinical reasoning should be taught throughout the 4 years of medical school, with the greatest emphasis in the clinical years. However, only a minority reported having teaching sessions devoted to clinical reasoning, citing a lack of curricular time and faculty expertise as the largest barriers. Our findings suggest that additional institutional and national resources should be dedicated to developing clinical reasoning curricula to improve diagnostic accuracy and reduce diagnostic error.” It does not address Active Learning per se. There are some references to suggestions by clerkship directors that clinical reasoning is often and probably best taught in small group case discussions, morning reports, and attending rounds.

Thomas, Patricia A. & Craig W. Bowen (2011) A Controlled Trial of Team-Based Learning in an Ambulatory Medicine Clerkship for Medical Students, Teaching and Learning in Medicine, 23:1, 31-36, DOI: 10.1080/10401334.2011.536888 (AL Clinical Application)

To link to this article: http://dx.doi.org/10.1080/10401334.2011.536888

The authors describe the effectiveness of using TBL for an Ambulatory Medicine Clerkship at Johns Hopkins. IRAT and GRAT grades were immediately available. Students were impressed by the increased scores on the GRAT. The TBL instructional treatment had a significant and positive effect on student performance in most topics. Courses evals for both instructional styles were similar. Comments on TBL clerkship were positive, e.g., “I really enjoyed and learned a lot from the TBL sessions. Having pre-reading made me able to focus and learn well during the session. I felt like I was able to participate well.”

Walling, Anne; Kathryn Istas, Giulia A. Bonaminio, Anthony M. Paolo, Joseph D. Fontes, Nancy Davis & Benito A. Berardo (2016): Medical Student Perspectives of Active Learning: A Focus Group Study, Teaching and Learning in Medicine, DOI: 10.1080/10401334.2016.1247708

To link to this article: http://dx.doi.org/10.1080/10401334.2016.1247708

The authors present an interesting study of medical students who voice their praise and criticisms of active learning. The value of this article lies in acknowledging the benefits, ““We
learned everything from actual cases and from each other. We picked things that we weren't familiar with ... then we'd teach it to each other,” as well as the student criticisms, ““A big thing is being able to trust ... Our time is so precious. We get so irritated when we're asked to do things that I feel are not high yield.” All in all, a valuable read for faculty embarking on using active learning in order to take advantage of the positives while mediating the negative perceptions.

Resources listed on the LCOM website:


Eddy SL, Hogan KA. Getting under the hood: how and for whom does increasing course structure work?. CBE-Life Sciences Education. 2014 Sep 21;13(3):453-68.


Huggett, K.N. and Jeffries, W.B. “Overview of Active Learning Research and Rationale for Active Learning” in A. Fornari and A. Poznanski (eds), How to Guide for Active Learning. International Association of Medical Science Educators; 2015.


