

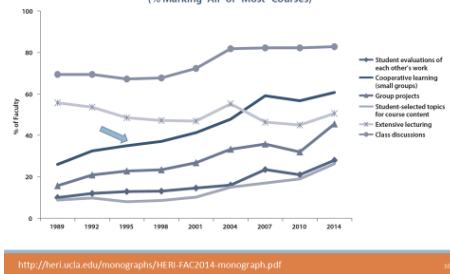
## Two Engineering Education Reform Examples for TPSE panel

### Pedagogies of Engagement: Cooperative Learning, Challenge-Based Learning (especially Problem-Based Learning)

- Smith, K. 2011. Cooperative Learning: Lessons and Insights from Thirty Years of Championing a Research-Based Innovative Practice. Link to paper on ASEE/IEEE Frontiers in Education conference site [<http://fie-conference.org/fie2011/papers/1240.pdf>]
- Smith, K.A., Cox, M. & Douglas, T. 2009. Supportive teaching and learning strategies in STEM education. *New Directions for Teaching and Learning*, 117 [[Smith-Douglas-Cox-Supportive Strategies STEM Ed-NDTL117-2009.pdf](#)]
- Smith, K.A., Sheppard, S.D., Johnson, D.W. and Johnson, R.T. 2005. Pedagogies of Engagement: Classroom-based Practices (cooperative learning and problem-based learning). *Journal of Engineering Education*, 94: 87–101 [[Smith-Pedagogies of Engagement.pdf](#)]
- Johnson, D.W., Johnson, R.T. & Smith, K.A. 1998. Cooperative learning returns to college: What evidence is there that it works? *Change*, 1998, 30 (4), 26-35. [[CLReturnstoCollege.pdf](#)]
- Smith, K.A. & Starfield, A.M. 1993. Building Models to Solve Problems. *Teaching Critical Thinking: Reports from Across the Curriculum* [[Smith-Starfield-Modeling Engineering Problems-Biddle Clarke-1993.pdf](#)]
- Smith, K.A., Johnson, D.W. & Johnson, R.T. 1981. Structuring learning to meet the goals of engineering education. *Journal of Engineering Education* [[Smith-Johnson-Johnson-Structuring Learning-JEE-1981.pdf](#)]

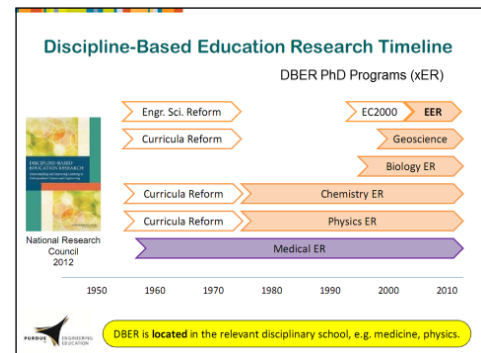
Undergraduate Teaching Faculty: The 2013–2014 HERI Faculty Survey

Figure 2. Changes in Faculty Teaching Practices, 1989 to 2014 (% Marking "All" or "Most" Courses)



### Engineering Education Research and Innovation (EER&I)

- Chavela Guerra, R., Smith, K.A. McKenna, A.F., Swan, C., Korte, R., Jordan, S., Lande, M. and McNeal, R. 2014. Innovation Corps for Learning: Evidence-based Entrepreneurship™ to Improve (STEM) Education. *ASEE/IEEE Frontiers in Education Conference*. [[I-Corps-L WIP FIE 2014.pdf](#)]
- Moore, Tamara J. and Smith, Karl A. 2014. Advancing the State of the Art of STEM Integration. *JSTEM Education* - [[Moore-SmithSTEMIntegrationJSTEMEd-15-1-2014](#)]
- Singer, Susan and Smith, Karl A. 2013. Discipline-Based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering. *Journal of Engineering Education*, 102 (4), 468–471 [[Singer-Smith-DBER-JEE-Oct 2013-jee20030.pdf](#)]
- Singer, Susan and Smith, Karl A. 2013. Follow the evidence: Discipline-based education research dispels myths about learning and yields results – if only educators would use it. *Last Word*, *ASEE Prism*, Summer. [[Last Word SUMMER final-1.pdf](#)]
- Froyd, J.E., Wankat, P.C. & Smith, K.A. 2012. Five major shifts in 100 years of engineering education. *Proceedings of the IEEE*, 100, 1344-1360. Link to article - <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=06185632>



- Atman, Cynthia J., Sheri D. Sheppard, Jennifer Turns, Robin S. Adams, Lorraine N. Fleming, Reed Stevens, Ruth A. Streveler, Karl A. Smith, Ronald L. Miller, Larry J. Leifer, Ken Yasuhara, and Dennis Lund. 2010. Enabling Engineering Student Success: The Final Report for the Center for the Advancement of Engineering Education. San Rafael, CA: Morgan & Claypool Publishers. [<http://www.engr.washington.edu/caee/index.html>]
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- Streveler, R.A., and K.A. Smith. 2006. Conducting rigorous research in engineering education. *Journal of Engineering Education* 95 (2): 103-105. [[Streveler-Smith-JEE-406-Editorial.pdf](#)]
- Smith, K.A. 2006. Continuing to build engineering education research capabilities. *IEEE Transactions on Education* 49 (1): 1-3. [[Smith-IEEE\\_Tr\\_on\\_Ed-Editorial-Feb\\_06.pdf](#)]
- Streveler, R.A., Smith, K.A., and Miller, R.L. 2005. Enhancing Engineering Education Research Capacity through Building a Community of Practice. *American Society of Engineering Education Annual Conference Proceedings* [[Streveler-Smith-Miller-2005-enhancing-engineering-education-research-capacity-through-building-a-community-of-practice-ASEE\\_Annual\\_Conference.pdf](#)]
- *IEEE/ASEE Frontiers in Education Conference* - El Paso, TX - October 21-24, 2015
  - Connecting and Expanding the Engineering Education Research and Innovation (EER&I) Communities
    - EER&I Networking Slides [[FIE-EERI-Network-2015-T1A-v8.pdf](#)]
    - EER & STEM Centers and Programs Slides - [[2015-ASEE-EERI-SLIDE-SHOW-v9.pdf](#)]
- *The Fourth International Workshop on Innovative Engineering Education* - Jeju Island, South Korea - January 9-11, 2013
  - Faculty Development Workshop (FDW2013)
    - Fundamentals of Engineering Education Research Draft Slides [[DFW2013-EER-Workshop-Smith-v2-draft.pdf](#)]
  - The Fourth International Workshop (IEE2013)
    - Global Perspectives on Engineering Education Research - Draft Slides [[IEE2013-Global\\_Perspective-EER-Smith-v1-draft.pdf](#)]