

Where Can I Find Flippable Moments in My Classes?

Presented by:

Barbi Honeycutt, Ph.D.

Sarah Egan Warren



©2014 Magna Publications Inc.

All rights reserved. It is unlawful to duplicate, transfer, or transmit this program in any manner without written consent from Magna Publications.

The information contained in this online seminar is for professional development purposes but does not substitute for legal advice. Specific legal advice should be discussed with a professional attorney.

Why Flip? 5 Techniques Supported by Research

Barbi Honeycutt, Ph.D., Founder, Flip It Consulting

Do you need to justify your decision to flip? Are you wondering if flipped strategies actually work? Do you need evidence for flipping and student learning? Here are 5 flipped strategies with summaries of published peer-reviewed research (both past and present) to support a few flipped techniques:

Pausing:

One easy way to flip a class or training session is to integrate brief pauses when giving a lecture or presentation. For example, in a one hour class, if you are lecturing, try to pause two or three times for two or three minutes and allow students to review and share their notes with a peer. Ruhl et al. (1987) found that that this technique impacted short term memory recall and long-term retention. Prince (2004) summarized, the class that used the pause procedure, “averaged 108 correct facts compared to 80 correct facts recalled in classes with straight lecture.” Prince (2004) continued, “Test scores were 89.4 with the pause procedure compared to 80.9 without pause for one class, and 80.4 with the pause procedure compared to 72.6 with no pause in the other class.”

Chunking:

Chunking is when you divide your lecture into parts and then giving students a few minutes in between to process what they’ve heard. Most instructors will group common parts of a lecture or groups of similar information into one chunk and then allow students time to work through a problem or discuss the information with other students. Wankat (200) found a variety of research articles which confirm that a student’s attention span during a lecture is approximately fifteen minutes. Hartley and Davies (1978) found that after a lecture, students remembered 70 percent of information presented in first ten minutes only 20 percent of information presented in last ten minutes.

Solving:

Find ways for students to engage in problem-solving and analysis during class. Real-world case studies, practice problems, and analysis exercises allow students opportunities to practice their skills, learn from peers, and assess their knowledge immediately so you can offer corrections or clarification. Weiman, Deslauriers, and Schelew (2011) draw on research in cognitive science, neuroscience, and learning theory. In their recent study, they used a technique called “deliberate practice” which challenges students to engage in the same practice and problem-solving techniques scientists apply to research. They compared an introductory course using deliberate practice to an introductory course using straight lecture. Students engaged in deliberate practice scored twice as high on a 12-question multiple-choice test of the material than those in the straight lecture. As a side bonus, attendance increased by 20% in the class using deliberate practice.

Interacting:

Designing opportunities for students to interact and engage in active learning experiences is the core of the flipped classroom. Regardless of which type of flipped model you use in your classes, research continues to provide evidence that interactivity and engagement enhance learning, retention, and motivation. Hake (1998) analyzed data for over 6,000 students in introductory physics courses. Prince (2004) summarized Hake's findings and explained, “Test scores measuring conceptual understanding were roughly twice as high in classes promoting engagement than in traditional courses. Statistically, this was an improvement of two standard deviations above that of traditional courses.”

Cooperating:

Most flipped classes usually require students to cooperate in groups. Whether you use semester-long teams or small group activities within each class (or both), students cooperating with other students has been shown to increase learning gains. Springer, Stanne, and Donovan (1999) determined that group work results in greater academic achievement, more favorable attitudes, and increased persistence. Pascarella and Terenzini (2005) found that cooperative learning and group work improved student learning by a .51 standard deviation.

Hopefully these resources will help you justify your decision to flip or encourage you to try at least one flipped strategy in your class, training session, or meeting. Our brains need stimulation, excitement, and opportunities to make meaning. Flipped strategies will help your students learn how to start making meaning for themselves as they struggle to learn new ways of thinking and solving problems in our rapidly changing world.

Resources

Deslauriers, L., Schelew, E., & Wieman, C. (May 2011). Improved learning in a large-enrollment physics class. *Science*. Vol. 334, no. 6031, p. 862-864

Hake, R. (1998). Interactive-engagement vs. traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*. Vol. 66, No. 1, p. 64.

Hartley, J., and Davies, I. (1978). Note taking: A critical review. *Programmed Learning and Educational Technology*. Vol. 15. p. 207–224.

Millis, B. Promoting deep learning. IDEA Paper No. 47. The Idea Center. Retrieved from: http://www.theideacenter.org/sites/default/files/IDEA_Paper_47.pdf

Pascarella, E.T. & Terenzini, P.T. (2005). *How College Affects Students: A Third Decade of Research*. San Francisco, CA: Jossey-Bass.

Prince, M. (2004). Does active learning work? A review of the research. p. 1-9. *Journal of Engineering Education*.

Ruhl, K., C. Hughes, and P. Schloss (1987). Using the pause procedure to enhance lecture recall. *Teacher Education and Special Education*. Vol. 10, Winter. p. 14–18.

Springer, L., Stanne, M.E., & Donovan, S. (1999). Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis. *Review of Educational Research*. 69, 21-51.

Wankat, P. (2002). *The Effective Efficient Professor: Teaching, Scholarship and Service*, Allyn and Bacon: Boston, MA.



Dr. Barbi Honeycutt is the Founder of Flip It Consulting in Raleigh, NC. Dr. Honeycutt teaches educators, trainers, and facilitators how to create effective learning environments using the FLIP! Dr. Honeycutt is also a scholar and educator at NC State University where she serves as the Director of Graduate Teaching Programs in the Graduate School and as an Adjunct Assistant Professor in the Department of Leadership, Policy and Adult and Higher Education in the College of Education.

References & Resources

Stay connected to Flip It Consulting & Barbi Honeycutt, Ph.D.:



www.flipitconsulting.com/blog



barbi@flipitconsulting.com



@flipitconsult



www.linkedin.com/in/barbihoneycutt

This is an ongoing list of journal articles, books, blogs, and videos about flipped classrooms, inverted instruction, backwards design, active learning, student-centered learning, learner-centered learning, effective learning environments, retention, and assessment:

Ambrose, S., Bridges, M., DiPietro, M., Lovett, M., & Norman, M. (2010). *How learning works: 7 research-based principles for smart teaching*. San Francisco, CA: Jossey-Bass.

Anderson L.W., & Krathwohl, D. (2001). *A taxonomy for learning, teaching, and assessing: a revision of Bloom's taxonomy of educational objectives*. New York: Longman.

Angelo, T. A. & Cross, K. P. (1993). *Classroom assessment techniques: A handbook for college teachers*. San Francisco, CA: Jossey-Bass.

Bain, K. (2004). *What the best college teachers do*. The President and Fellows of Harvard College.

Baker, J. W. (April 2000). The "classroom flip": Using web course management tools to become a guide by the side. Paper presented at the 11th international conference on college teaching and learning, Jacksonville, FL.

Barba, L. (2012). This CFD course is flippin'. Blog post available online:
http://people.bu.edu/labarba/Lorena_Barba/Blog/Entries/2012/2/1_This_CFD_class_is_flippin.html

Barr, R. B. & Tagg, J. (November – December, 1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, 27(6), pages 12-25.

Bates, S. & Galloway, R. (2013) Inverted classroom in a large enrolment introductory physics course: A case study. In n: HEA STEM: Annual Learning and Teaching Conference, 17-18 Apr 2013, University of Birmingham. (Unpublished) Retrieved from http://www.heacademy.ac.uk/assets/documents/stem-conference/PhysicalSciences/Simon_Bates_Ross_Galloway.pdf

Bean, J. (1996). *Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom*. San-Francisco, CA: Jossey-Bass.

Bergmann, J. & Sams, A. (2012). *Flip Your Classroom: Reach Every Student in Every Class Every Day*. International Society for Technology in Education.

Berrett, D. (February 19, 2012). How “flipping” the classroom can improve the traditional lecture. *Chronicle of Higher Education*. Online at <http://chronicle.com/article/How-Flipping-the-Classroom/130857/>

Biggs, J. (1999). What the students does: Teaching for enhanced learning. *Higher Education Research & Development*. Vol. 18. No. 1. Available online http://www.tcd.ie/teaching-learning/academic-development/assets/pdf/Biggs_1999_Teaching_for_enhanced_learning.pdf

Bogost, I. (August 27, 2013). The condensed classroom. The Atlantic. Online at <http://www.theatlantic.com/technology/archive/2013/08/the-condensed-classroom/279013/>

Bonwell, C. and Eison, J. (1991). *Active learning: Creating excitement in the classroom* (No. 1). Washington, DC: George Washington University Clearinghouse on Higher Education.

Bonwell, C. & Sutherland, T. (1996). The active learning continuum: Choosing activities to engage students in the classroom. *New Directions for Teaching and Learning*. no. 67. Jossey-Bass.

Bradt, G. (October 31, 2012). Follow the ‘flipped classroom’ model in business presentations. *Forbes*. Online at <http://www.forbes.com/sites/georgebradt/2012/10/31/follow-the-flipped-classroom-model-in-business-presentations/>

Brame, C. (2013). Flipping the classroom. Online at <http://cft.vanderbilt.edu/teaching-guides/teaching-activities/flipping-the-classroom/>

Cannod, G. C., Burge, J. E., & Helmick, M. T. (2007). Using the inverted classroom to teach software engineering. *Computer Science and Systems Analysis Technical Reports*. Miami University. Online at: <http://sc.lib.muohio.edu/bitstream/handle/2374.MIA/206/fulltext.pdf?sequence=1>

Coffman, S. J. (2003). Ten strategies for getting students to take responsibility for their learning. *College Teaching*, 51, 2-4.

Corrigan, P. (December 23, 2013). To lecture or not to lecture. Online at <http://www.theatlantic.com/education/archive/2013/12/to-lecture-or-not-to-lecture/282585/>

Covill, D., Patel, B. A., Gill, D. S. (2013). Flipping the classroom to support learning: An overview of flipped classes from science, engineering, and product design. *School Science Review*. 95(350). pp. 73-80.

Dwortzan, M. (date unavailable). “Flipped classroom” energizes computational fluid dynamics course. Online at <http://www.bu.edu/phpbin/news-cms/news/?dept=666&id=59184>

Means, B. et al (2010). Department of Education, Office of Planning, Evaluation, and Policy Development. Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. Washington, DC. Online at <http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>

Deslauriers, L., Schelew, E., & Weiman, C. (2011). Improved learning in a large-enrollment physics class. *Science*. 332. 862-864.

EDUCAUSE. (February 2012). 7 things you should know about flipped classrooms. Online at: <http://net.educause.edu/ir/library/pdf/ELI7081.pdf>

Felder, R. and Brent, R. (1996). Navigating the bumpy road to student-centered instruction. Online at: <http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/Resist.html> (also available in *College Teaching*, 44, 43-47)

Felder, R. and Brent, R. (August 2009). Active learning: An introduction. *ASQ Higher Education Brief*, 2(4). Online at: <http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/ALpaper%28ASQ%29.pdf>

Foertsch, J., Moses, G., Strikwerda, J., & Litzkow, M. (July 2002). Reversing the lecture/homework paradigm using eTEACH web-based streaming video software. *Journal of Engineering Education*.

Gerstein, J. (May 15, 2012). Flipped classroom: The full picture for higher education. Online at <http://usergeneratededucation.wordpress.com/2012/05/15/flipped-classroom-the-full-picture-for-higher-education>

Halpern, D. F. & Hakel, M.D. (2003). Teaching for long-term retention and transfer. *Change*, July/August, 37-41.

Hamdan, N., McKnight, P., & Arfstrom, K. (2013) A review of flipped learning. Flipped Learning Network. Online at http://flippedlearning.org/cms/lib07/VA01923112/Centricity/Domain/41/LitReview_FlippedLearning.pdf

Hill, P. (October 22, 2013). A response to USA Today article on flipped classroom research. Online at <http://mfeldstein.com/response-usa-today-article-flipped-classroom-research/>

Hobson, E. H. (2004). Getting students to read: Fourteen tips. IDEA Paper Number 40. Manhattan, KS: IDEA Center. Online at http://www.theideacenter.org/sites/default/files/Idea_Paper_40.pdf

Honeycutt, B. (2012). *101 Ways to FLIP! Flip It Consulting*. Raleigh, NC.

Honeycutt, B. (2013). Five ways to address student resistance in the flipped classroom. Fractus Learning. Online at: <http://www.fractuslearning.com/2013/07/01/student-resistance-flipped-classroom/>

Honeycutt, B. (2013). Looking for 'flippable' moments in your class. *Faculty Focus*. Online at <http://www.facultyfocus.com/articles/instructional-design/looking-for-flippable-moments-in-your-class/>

Honeycutt, B. (2012). A syllabus tip: Embed big questions. *Faculty Focus*. Online at <http://www.facultyfocus.com/articles/instructional-design/a-syllabus-tip-embed-big-questions/>

Honeycutt, B. & Garrett, J. (September 2013). The flipped approach to a learner-centered class. (whitepaper). Magna Publications.

Houlton, D. (2013). Flipping your classroom. Online at <https://sites.google.com/site/dougholtonresources/toolbox/teach/flippedclass>

Hudler, M. (November 15, 2013). What happens (or doesn't) when we lecture. Online at <http://profology.com/blogs/357/67/what-happens-or-doesn-t-when-w>

Karpicke, J. D. & Roediger III, H. L. (2007). Repeated retrieval during learning is the key to long-term retention. *Journal of Memory and Language*, 57(2), 151-162.

Khan, S. (2011). Let's use video to reinvent education. Online at http://www.ted.com/talks/salman_khan_let_s_use_video_to_reinvent_education.html

Khourey-Bowers, C. (Apr 2011). Active Learning Strategies: The Top 10. *Science Teacher*. Vol. 78. No. 4. National Science Teachers Association. Arlington, VA.

Knewton. (2011). The flipped class infographic. Online at: <http://www.knewton.com/flipped-classroom/>

Kolowich, S. (November 15, 2011). *Exploding the Lecture*. Online at: <http://www.insidehighered.com/news/2011/11/15/professor-tries-improving-lectures-removing-them-class>

Lage, M., Platt, G., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *Journal of Economic Education*. Vol. 31. No. 1 (Winter). pp. 30-43. Taylor & Francis.

Largent, D. L. (October 2012). A tale of two courses: An experience report about student engagement related to the use of an electronic student response system and pre-lecture videos. *The Journal of Computing Sciences in Colleges*, 28(1), 47-54.

Mascolo, M. F. (2009). Beyond student-centered and teacher-centered pedagogy: Teaching and learning as guided participation. *Pedagogy and the Human Sciences*, (1)1, 3-27.

Mason, G., Shuman, T., & Cook, K. Comparing the effectiveness of an inverted classroom to a traditional classroom in an upper-division Engineering course. *IEEE Transactions on Education*. Vol. 56. No. 4, pp. 430-435.

Mazur, E. (1997), *Peer Instruction: A User's Manual*. Prentice–Hall, Upper Saddle River, NJ.

Mazur E (2009). Farewell, Lecture? *Science* 323: 50-51

Mazur, E. (March 13, 2013). The flipped classroom will redefine the role of educators. Evollution. Online at: http://www.evollution.com/distance_online_learning/audio-flipped-classroom-redefine-role-educators-10-years/

McKeachie, W. (2011). *McKeachie's teaching tips*. Belmont, CA: Wadsworth, Cengage Learning.

Medina, J. (2008). *Brain rules*. Pear Press, Seattle.

Meyers, C., and Jones, T. B. (1993). *Promoting active learning: Strategies for the college classroom*. San Francisco, CA: Jossey-Bass.

Middendorf, J., & Kalish, A. The 'change-up' in lectures. *National Teaching and Learning Forum*. 5(2), January 1996. Online at <http://www.ntlf.com/issues/v5n2/v5n2.pdf>

Millard, E. (2012). 5 reasons flipped classrooms work: Turning lectures into homework to boost student engagement and increase technology-fueled creativity. *University Business*, 15(11), 26.

Moravec, M., Williams, A., Aguilar-Roca, N., & O'Dowd, D. K. (Winter 2010). Learn before lecture: A strategy that improves learning outcomes in a large introductory biology class. *CBE Life Sci Educ*, 9(4), 473-481.

Moore, E. (May 20, 2013). From passive viewing to active learning: Simple techniques for applying active learning strategies to online course videos. *Faculty Focus*. Online at:

<http://www.facultyfocus.com/articles/teaching-with-technology-articles/from-passive-viewing-to-active-learning-simple-techniques-for-applying-active-learning-strategies-to-online-course-videos/>

Nicol, D. J. & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, 31(2), 199-218.

Ojalvo, H. E. & Doyne, S. (December 8, 2011). Five ways to flip your classroom with the New York Times. Online at <http://learning.blogs.nytimes.com/2011/12/08/five-ways-to-flip-your-classroom-with-the-new-york-times/>

Paulson, A. (April 20, 2014). Blended learning revolution: Tech meets tradition in the classroom. *Christian Science Monitor*. Online at <http://www.csmonitor.com/USA/Education/2014/0420/Blended-learning-revolution-Tech-meets-tradition-in-the-classroom>

Prober, C. G. and Heath, C. (2012). Lecture halls without lectures: A proposal for medical education. *The New England Journal of Medicine*. 366. 1657-1659.

Reynolds, J. (2000). Learning-centered learning: Theory into practice. *Inquiry*, (5)2,

Riendeau, D. (2012). Flipping the classroom. *The Physics Teacher*. 50, 507.

Rosenberg, T. (October 9, 2013). Turning education upside down. *The New York Times*. Online at <http://opinionator.blogs.nytimes.com/2013/10/09/turning-education-upside-down/?smid=fb-share&r=2>

Sams, A. (November 5, 2011). There is no such thing as THE flipped class. Online at <http://chemicalsams.blogspot.com/2011/10/there-is-no-such-thing-as-flipped-class.html>

Schell, J. (2012). Turn to your neighbor. Blog available at <http://blog.peerinstruction.net/>

Schell, J. (November 4, 2013). From flipped classrooms to flipping with peer instruction. Online at <http://blog.peerinstruction.net/2013/11/04/from-flipped-classrooms-to-flipping-with-peer-instruction/>

Shaver, M. (Dec 2010). Using low tech interactions in the Chemistry classroom to engage students in active learning. *Journal of Chemical Education*. Vol. 87 No. 12.

Smith, C. V., & Cardaciotto, L. (January 2011). Is active learning like broccoli? Student perceptions of active learning in large lecture classes. *Journal of the Scholarship of Teaching and Learning*. Vol. 11. No. 1. 53-61.

Sportsman, S. (February 10, 2014). Flipped classroom blends e-access to content with face-to-face problem-solving. AdvanceWeb. Online at http://community.advanceweb.com/blogs/nurses_18/archive/2014/02/10/flipped-classroom-blends-e-access-to-content-with-face-to-face-problem-solving.aspx

Straumsheim, C. (September 9, 2013). Flipping med ed. *Insider Higher Ed*. Online at <http://www.insidehighered.com/news/2013/09/09/stanford-university-and-khan-academy-use-flipped-classroom-medical-education#.Ui33joj8als.twitter>

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research*, 15(2), 171-193.

Svinicki, M.D. (2010). Students learning: From teacher-directed to self-regulation. *New Directions for Teaching and Learning* (123), 73-83.

Talbert, R. (January 27, 2014). The inverted Calculus course: Overture. *The Chronicle of Higher Education*. Online at: http://chronicle.com/blognetwork/castingoutnines/2014/01/27/the-inverted-calculus-course-overture/?utm_source=dlvr.it&utm_medium=facebook

Talbert, R. (March 5, 2014). Creating learning objectives, flipped classroom style. *The Chronicle of Higher Education*. Online at: <http://chronicle.com/blognetwork/castingoutnines/2014/03/05/creating-learning-objectives-flipped-classroom-style/>

Talbert, R. (April 28, 2014). Flipped learning skepticism: Is flipped learning just self-teaching? *The Chronicle of Higher Education*. Online at http://chronicle.com/blognetwork/castingoutnines/2014/04/28/flipped-learning-skepticism-is-flipped-learning-just-self-teaching/?cid=wc&utm_source=wc&utm_medium=en

Tucker, B. (Winter, 2012). *The flipped classroom*. Online at <http://educationnext.org/the-flipped-classroom/>

University of Minnesota. Flipping your PowerPoint slides. Online at: <http://www1.umn.edu/ohr/teachlearn/tutorials/powerpoint/learning/index.html>

University of Wisconsin-Madison. How flipping the classroom can improve the traditional lecture. Online at: <https://tle.wisc.edu/tleblogs/jhenriqu/how-flipping-classroom-can-improve-traditional-lecture>

Walsh, K. (2012). Reverse instruction tools and techniques, part 1. Online at: <http://www.emergingedtech.com/2012/02/reverse-instruction-tools-and-techniques-part-1/>

Watson, D. L., Kessler, D. A., Kalla, S., Kam, C. M., and Ueki, K. (1996). Active learning exercises are more motivating than quizzes for underachieving college students. *Psychological Reports*, 78, 131-134.

Weimer, M. (May 15, 2013). Learner-centered teaching: Good places to begin. *Faculty Focus*. Online at <http://www.facultyfocus.com/articles/teaching-professor-blog/learner-centered-teaching-good-places-to-begin/>

Weimer, M. (2002). *Learner-centered teaching: Five key changes to practice*. San Francisco, CA: Jossey-Bass.

Weirath, K. & Perkins, D. (2005). Knowledge surveys: An indispensable course design and assessment tool. *Innovations in the Scholarship of Teaching and Learning*.

Wiggins, G. (1998). *Educative assessment: Designing assessments to inform and improve student performance*. San Francisco: Jossey-Bass.

Wilson, S. G. (2013). The flipped class: A method to address the challenges of an undergraduate statistics course. *Teaching of Psychology*, 40(3), 193-199.

Zellner, A. (February 12, 2012). Flipping out? What you need to know about the flipped classroom. *Insider Higher Education*. Online at <http://www.insidehighered.com/blogs/gradhacker/flipping-out-what-you-need-know-about-flipped-classroom>