



# Blended Learning: What's Next? Creating Collaborative Learning Opportunities

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National Teaching Enhanced Learning Conference 2019  
*Singapore Management University*

20 November 2019

# Pedagogical advantage

*“evidence shows that it is not the technology per se that changes learning and teaching but the **pedagogical advantage** we make of its use”*

Price and Kirkwood (2008)

Price, L., and A. Kirkwood (2008) *Technology in the United Kingdom's higher education context*. In S. Scott & K. Dixon (Eds.), *The 21st Century, Globalised University: Trends and Development in Teaching and Learning* (pp. 83–113). Perth: Black Swan.

# Solvable problem

Poorly designed  
blended learning courses

# What are the key elements?

1. Provide an opportunity for students to gain **first exposure** prior to class;
2. Provide an **incentive** for students **to prepare** for class;
3. Provide a **mechanism** to **assess student understanding**; and,
4. Provide **in-class activities** that focus on **higher level cognitive activities**.

Brame, C., (2013) *Flipping the classroom*, Vanderbilt University Center for Teaching [Retrieved 12 February 2015 from <http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/>].

# Using Multimedia for E-learning

Reducing  
extraneous  
processing

## Coherence

Exclude interesting but irrelevant material as this reduces cognitive capacity to process essential material in a lesson.

## Signaling

Include vocal cues and/or visual highlights to aid the selection & organization of important info, especially for learners with low prior knowledge.

## Redundancy

Graphics with narration alone is more effective than also including on-screen text. Adding one or two keywords as on-screen text has benefit.

## Contiguity

Place printed words near any corresponding graphics and coincide narration with related display.

Managing  
essential  
processing

## Segmenting

Add self-pacing options to enable learners to process information before continuing.

## Pre-training

Provide option to view information on key terms to allow learners to familiarize before having to work with them.

## Modality

Present information about a graphic verbally rather than as text so that learners can listen and refer to graphic, especially for system paced dynamic graphics (e.g. videos).

Fostering  
generative  
processing

## Personalisation

Present words in conversational style rather than formal style, including the use of personal pronouns (I & you) in script, especially in early stages

## Voice

Narration should use a human voice rather than a computer voice, and this should match any on-screen character.

## Embodiment

Drawing graphics as you explain is more beneficial than explaining a presented drawing as it reflects a real-life social interaction

Mayer, R. E. (2017) Using multimedia for e-learning, *Journal of Computer Assisted Learning*, doi: 10.1111/jcal.12197

# Just-in-Time Teaching

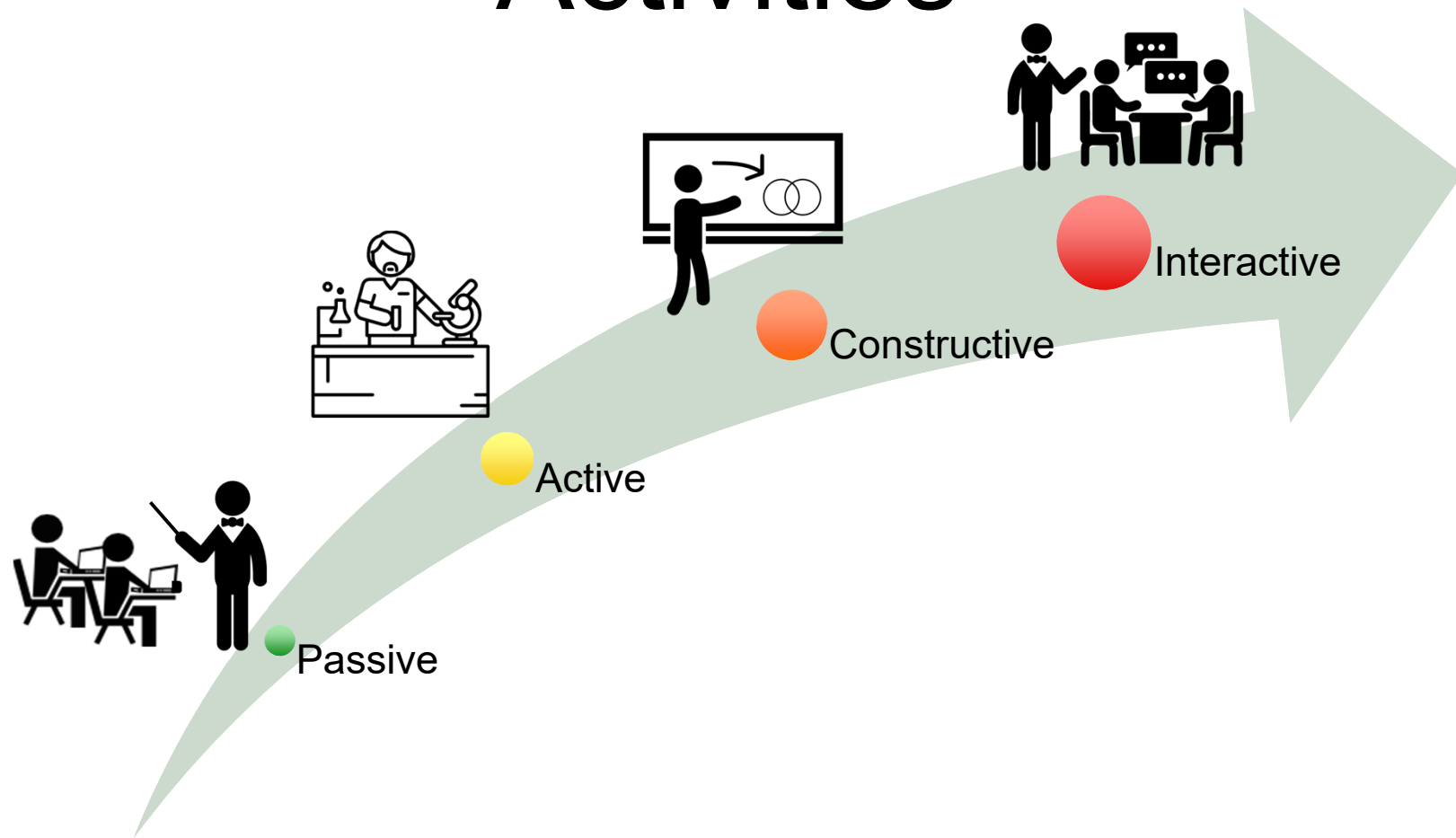
*“The most important single factor influencing learning is what the learner already knows. Ascertain this and teach [them] accordingly.”*

Ausubel (1968)

Novak, G. N., E. T. Patterson, A. Gavrin, and W. Christian (1999) *Just-in-Time Teaching: Blending Active Learning and Web Technology*, Saddle River: Prentice Hall.

Ausubel, D. P. (1968) *Educational Psychology: A Cognitive View*, New York: Rinehart and Winston, Inc.

# Designing Learning Activities



Mirriahi, N., D. Alonzo and B. Fox. (2015) A blended learning framework for curriculum design and professional development, *Research In Learning Technology*, **23**: doi:<http://dx.doi.org/10.3402/rlt.v23.28451>.

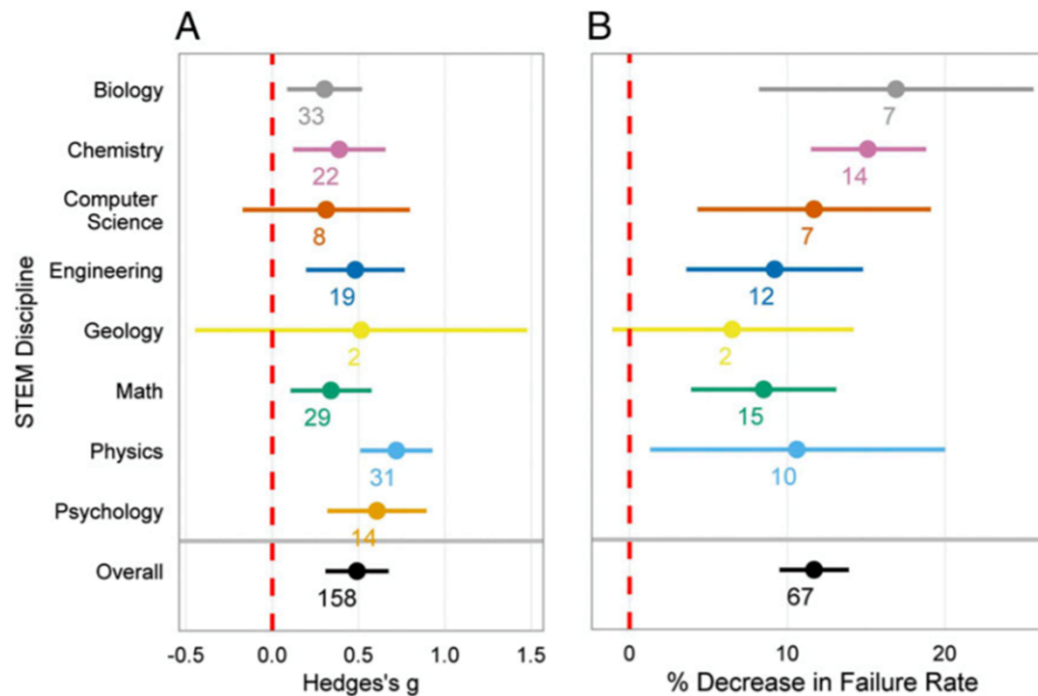
# Difficult problem

Faculty and student  
resistance to change



# Active learning increases student performance in science, engineering, and mathematics

Scott Freeman<sup>a,1</sup>, Sarah L. Eddy<sup>a</sup>, Miles McDonough<sup>a</sup>, Michelle K. Smith<sup>b</sup>, Nnadozie Okoroafor<sup>a</sup>, Hannah Jordt<sup>a</sup>, and M. P. Wenderoth<sup>a</sup>



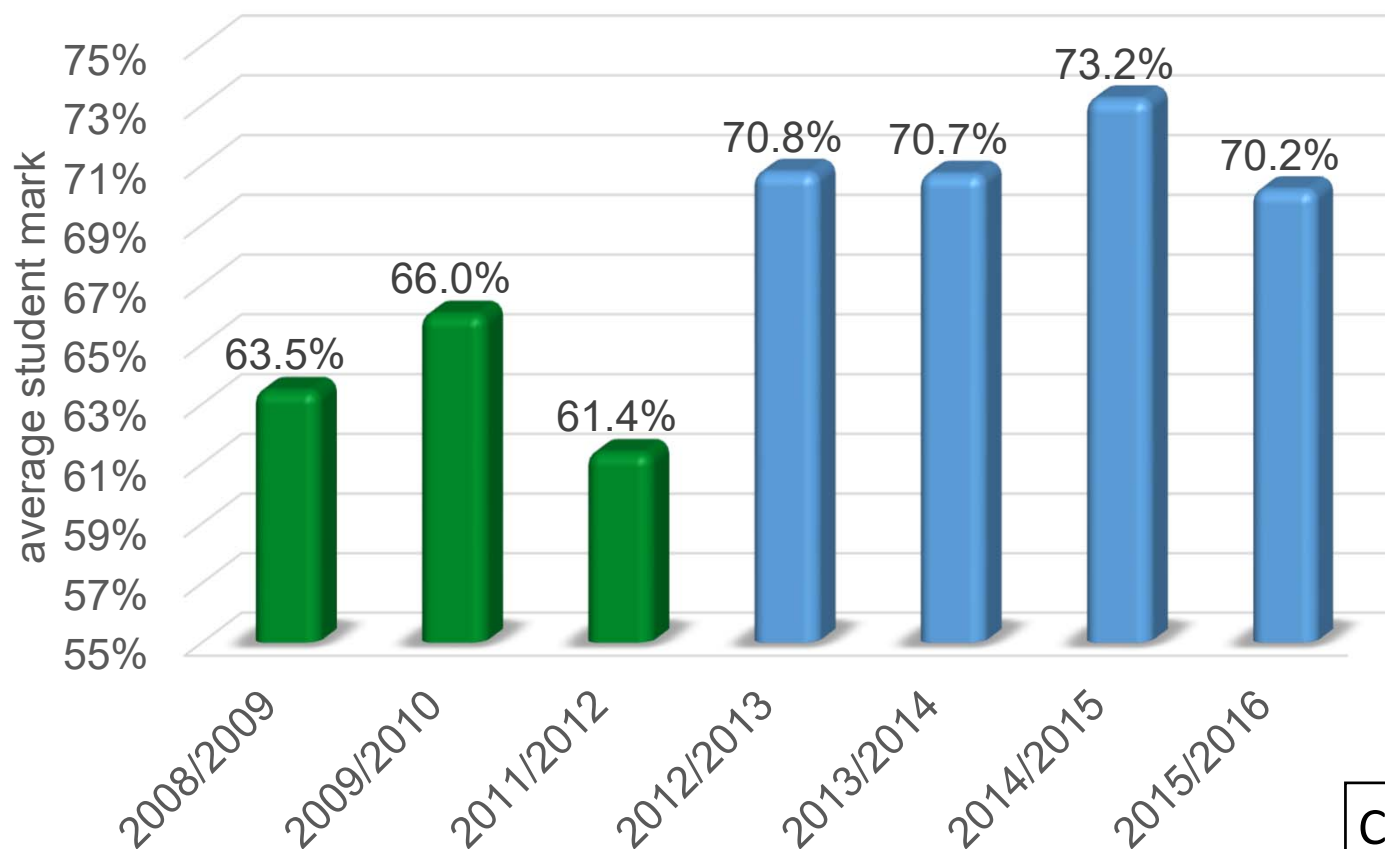
**Fig. 2.** Effect sizes by discipline. (A) Data on examination scores, concept inventories, or other assessments. (B) Data on failure rates. Numbers below data points indicate the number of independent studies; horizontal lines are 95% confidence intervals.

constructivism | undergraduate education | evidence-based teaching | scientific teaching

tional lecturing—a difference that represents a 55% increase (Fig. 1 and Fig. S1).

Freeman, S., S. L. Eddy, M. McDonough, M. K. Smith, N. Okoroafor, H. Jordt and M. P. Wenderoth. (2014) Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*. **111**, 8410–8415.

# Student learning gain



Cohen's  $d = 0.59$   
 $p$  value  $< 10^{-16}$

# Reflecting on the learning process

*“A ‘metacognitive’ approach to instruction can help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them”*

Bransford *et al.* (2000, p. 18)

Bransford, J. D., A. L. Brown and R. R. Cocking (2000) *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academy Press.

# Wicked problem

Rethinking the  
practice of teaching

# Rethinking the practice of teaching

*“Without sufficient access to sustained support and the tools and resources essential in the design of a student-centered environment, instructors are challenged to create these experiences on their own. Managing the changing practice of teaching requires that institutions intentionally design faculty support that is not bound by location or time.”*

Alexander et al. (2019, p. 19)

Alexander, B., K. Ashford-Rowe, N. Barajas-Murphy, G. Dobbin, J. Knott, M. McCormack, J. Pomerantz, R. Seilhamer and N. Weber (2019) *EDUCAUSE Horizon Report: 2019 Higher Education Edition*. Louisville, Co: EDUCAUSE.