I will not flip the upside down classroom.
Suppose the educational system is drastically altered to reflect the structure of society and what we now understand about how people learn. How will what universities teach be different?

- more about how to process and use information, less about imparting
- more collaboration and more evaluation on the ability to work with others
- new technologies allowing constant revision of materials
- active & dynamic learning
- breed cosmopolitanism
- much more emphasis on the analysis of data
lecture + clickers (2011-2012)
CIT TBL fellowship (Summer 2012)
MOOC development (2013 - 2014)
fully flipped course (Fall 2013 - present)
flipped course study (Fall 2014 - present)
what is different?

constantly thinking

constantly challenged

constantly engaged with each other (team + class)
videos + learning objectives + reading

readiness assessment (individual + team)

mini-lectures w/ clicker questions

application exercises (in teams)

computational lab (in teams)

problem set + performance assessment

how
LO 15. Define a robust statistic (e.g. median, IQR) as a statistic that is not heavily affected by skewness and extreme outliers, and determine when such statistics are more appropriate measures of center and spread compared to other similar statistics.

https://duke.coursera.org/duke-statistics-001/lecture/21
1. Which is **more** affected by extreme observations, the mean or median? And how about the standard deviation or IQR?

(a) median, IQR  
(b) mean, IQR  
(c) median, SD  
(d) mean, SD

2. The midrange is defined as the average of the maximum and the minimum.  
**True or False:** This statistic is robust to outliers.

(a) True  
(b) False
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**Correction:** Large samples, as long as they are collected randomly, will resemble their parent populations.

**True or False:** You are going to collect income data from a right-skewed distribution of incomes of politicians. If you take a large enough sample from that distribution, the sample mean and the sample median will always have the same value.

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(a) True

(b) **False**
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<th>Exercise</th>
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**why flip?**

**faculty:** spend less time on basic questions + more time on higher-level activities and discussions

**students:** help each other fill in knowledge gaps + defend their solutions to challenging real-world problems

**organization:** structured videos, readings, activities, and discussions enable students to focus more quality time on learning

**feedback:** consistent feedback during every class meeting and can more readily adapt to achieve success

**shift:** students come to class having done the reading, ready to work and become responsible for their own learning

**reallocate:** spend class time actively and collaboratively solving problems and practicing discipline-specific skills

**collaborate:** working in teams enables students to hear alternative viewpoints and bring their talents to the discussion