The Changing Role of the Tutor

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Virtual lecture capture (VLC) technologies such as Panopto allow students & staff to access lectures outside of ‘normal’ classes:

- Audio
- Video
- Powerpoint slides
- ‘in-show’ videos/websites
- Anything else that the camera is configured to record

→ more flexible learning opportunities.

Potential benefits for all participants.

I want my students to be engaged, interacting, actively participating, learning, enjoying, making new links, reflecting, thinking critically (& thinking like scientists) – regardless of the size of the class!

Possible techniques:

encourage questions from the floor...

ask the class to think about the question & discuss their solution with their neighbours;
concept tests;
wrap-up lists;
‘question of the day’...

http://serc.carleton.edu/NAGTWorkshops/earlycareer/teaching/largeclasses.html


Many animals do not live long beyond
their prime reproductive period.

Quick Quiz 1

Many primates *do* live past their prime reproductive years.

Why?

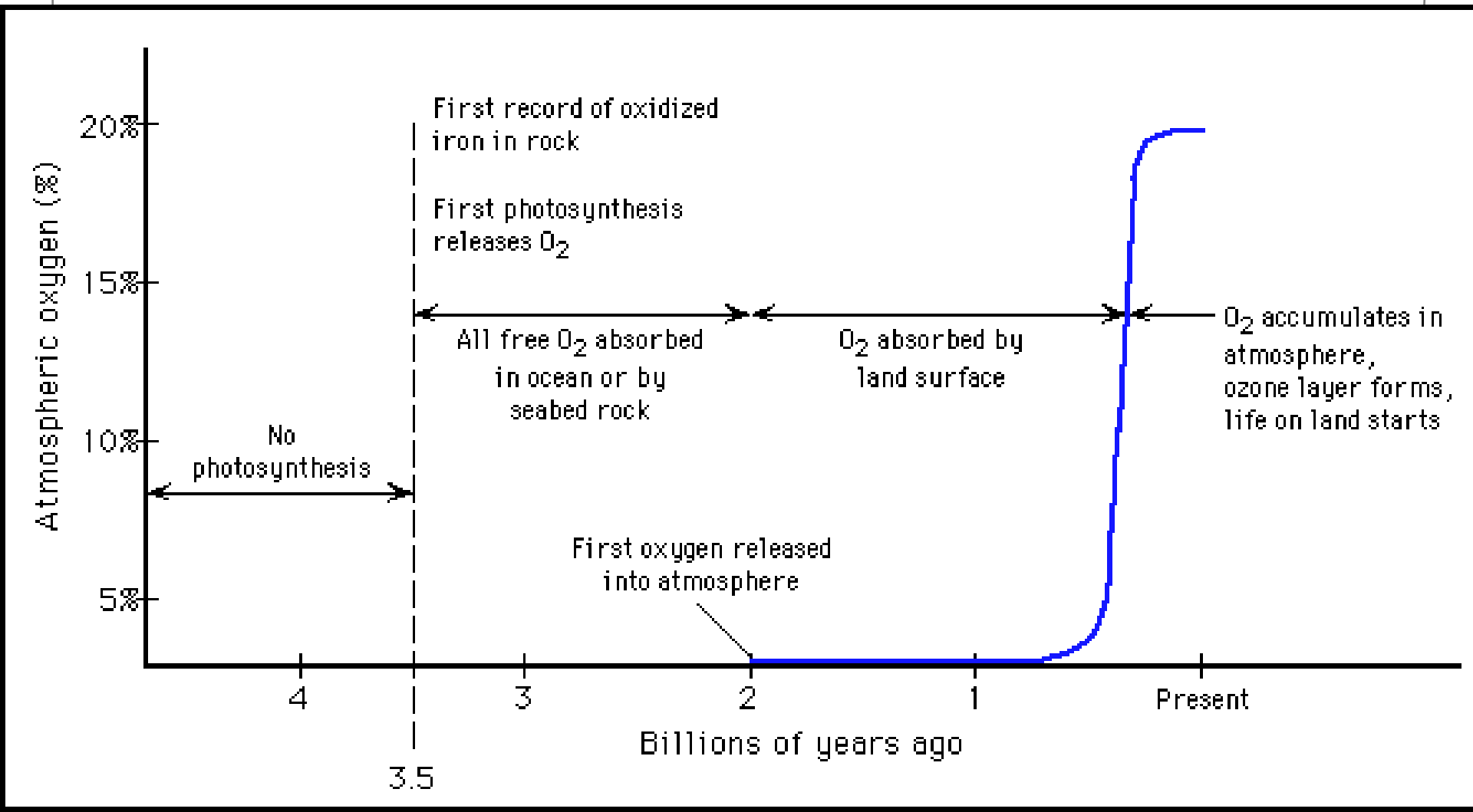
How would you test this hypothesis?

Valuable outcomes for *any* student:
Comprehension, interpretation, explanation, inference

Without plants, life as we know it wouldn't have evolved in the first place.

WHY NOT?

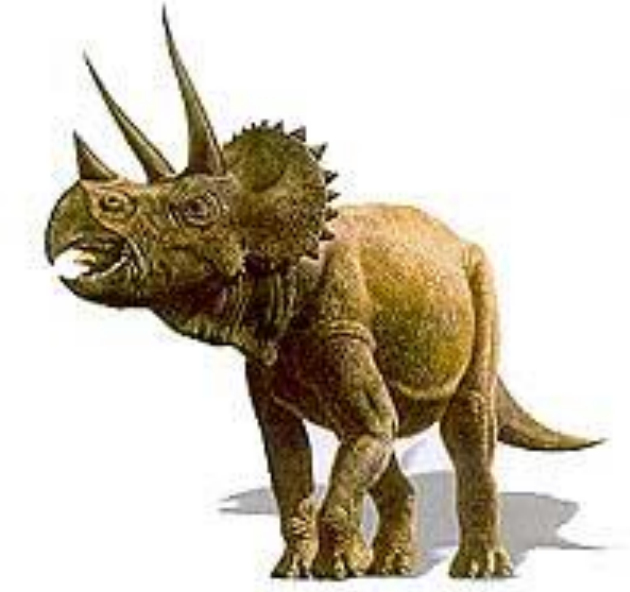
Without plants, life as we know it wouldn't have evolved in the first place. WHY NOT?



Tyrannosaurus rex:
lumbering 10-ton lizard – or
10,000lb chicken from hell?

Quick quiz 2

Were dinosaurs
a) ‘cold-blooded’ (like other reptiles)?
b) ‘warm-blooded’ (like mammals & birds)?



What evidence would you need to answer the question in an informed way?

Evidence for homeothermy in some dinosaurs

(**NB** this is not an exhaustive list ☺)

Fossil trackways: stride lengths indicate relatively high speeds; tails didn't drag when moving;

Predator-prey ratios similar to those in modern systems dominated by endothermic predators;

Lived where it was COLD – remains found in Cretaceous polar regions;

Affinities with modern birds (also endotherms)...

What's the **evidence** that this sort of approach works to enhance student learning outcomes?

Research-based, has positive impact on students' learning

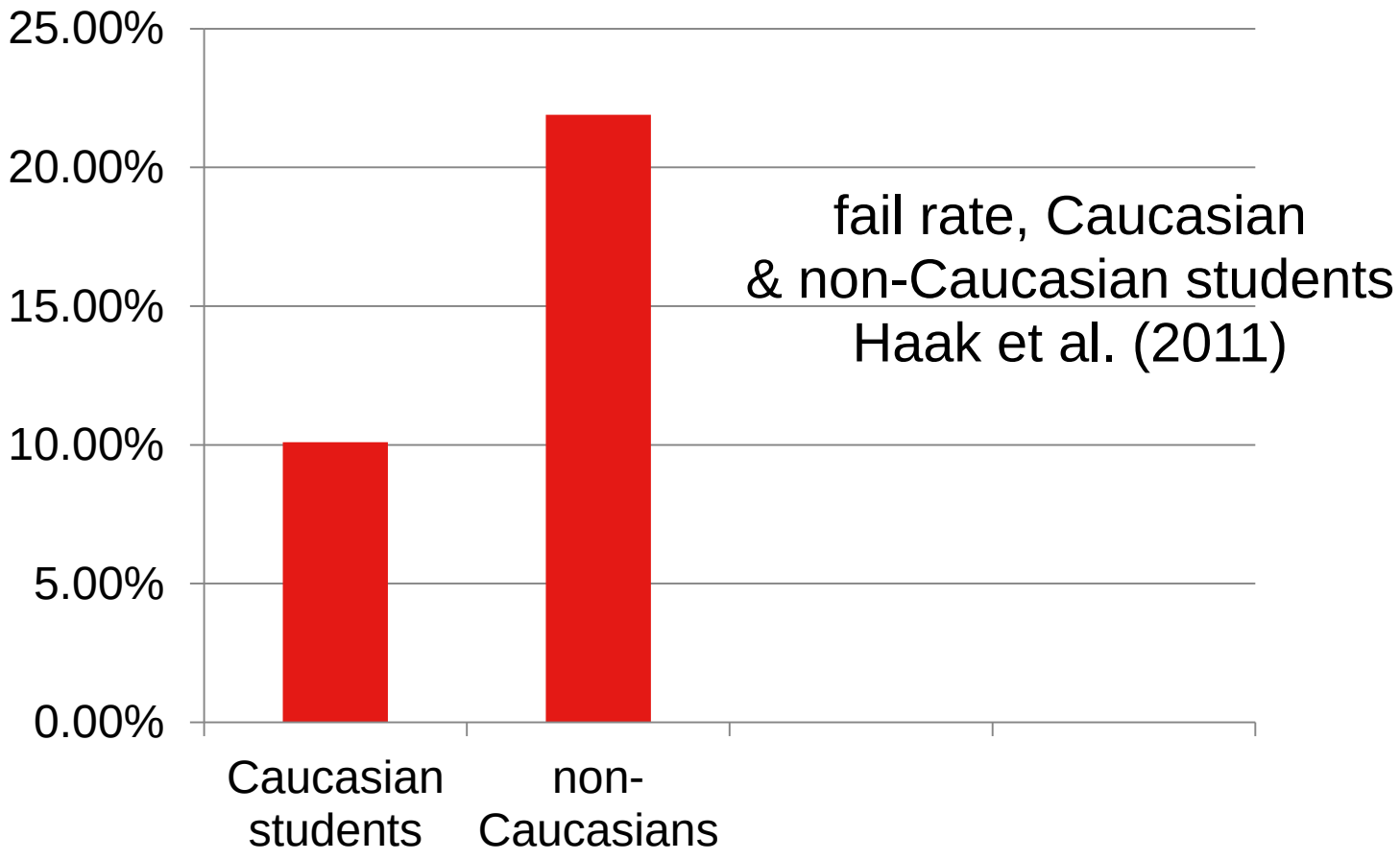
e.g. Deslauriers L., Schelew E., & Wieman C. (2011). Improved learning in a large-enrolment physics class. *Science (New York, N.Y.), 332* (6031), 862-4 PMID: 21566198

	Control classes	'Flip' class
Attendance	55-57%	75%
Engagement	45%	85%
Test before (mean)	47%	47%
Test after (mean)	41%	74%

77% felt that they'd learn more if the entire first-year physics course was taught that way.

(from: Deslauriers, Schelew & Wieman, 2011)

Haak D.C., HilleRisLambers J., Pitre E., & Freeman S. (2011). Increased structure and active learning reduce the achievement gap in introductory biology. *Science (New York, N.Y.), 332*(6034), 1213-6 PMID: 21636776



Their study looked at the impacts of:

Original teaching style: traditional lecture format.

First ‘treatment’: lectures plus daily MC questions & weekly practice tests.

Second ‘treatment’: no lectures: pre-class reading quizzes, daily MC questions, weekly practice tests, extensive group work in class.

"The highly structured [third] approach resulted in another increase in overall performance by all students, compared with the low-structure, lecture-intensive course with no required active learning and the moderate-structure design based on clickers and a weekly practice exam."

"… although all students benefit from [highly structured teaching], [non-Caucasian] students experience a disproportionate benefit."

from Haak, HilleRisLambers, Pitre, & Freeman (2011).

Wilson, C.D., Taylor, J.A., Kowalski, S.M. & Carlson, J. (2010) The relative effects of inquiry-based and commonplace science teaching on students' knowledge, reasoning, and argumentation. *Journal of Research in Science Teaching* **47** (3): 276-301 doi: 10.1002/tea.20329

Students in inquiry-based classes "reached significantly higher levels of achievement than students experiencing 'commonplace' instruction", while at the same time 'commonplace' pedagogy "resulted in a detectable achievement gap by race, whereas the inquiry-based materials did not."

‘Flipping’ lectures – treating lectures as really, really large tutorials, where the *students* do the work.

Opportunities for active learning.

Necessary content as reading assignments (or from prior lectures).

Design-a-plant

How did students perceive this form of learning?

Please comment on the ‘design-a-plant’ and ‘design-an-animal’ exercises – what was their impact on your understanding of plant & animal form & function?

I found these to be a waste of a lecture as they didn’t enhance my understanding at all.

These were great as it put to work what had been learned (or not) & gave me a better idea of how many things are interrelated.

Good – maybe could be mini-assignments or done in tuts to not use up lecture time?

Very helpful way to use the information we had acquired. Helped to back up my understanding

Positive impact on understanding of concepts.

Very useful, reinforces previous knowledge & lectures in a fun way.

Helpful and fun. Made you really think about the environmental factors affecting animal/plant design.

Able to comprehend suitable life-forms applicable to given environments and utilise the info learned in lectures in a practical manner.

What else do students gain?

- Peer-assisted learning
- Practice at written & oral communication of ideas
- Group work

But remember to:

- Plan carefully.
- Explain carefully what you are going to do, *and why.*
- Assess learning appropriately.