

Neue Technologien in der Studien- eingangsphase

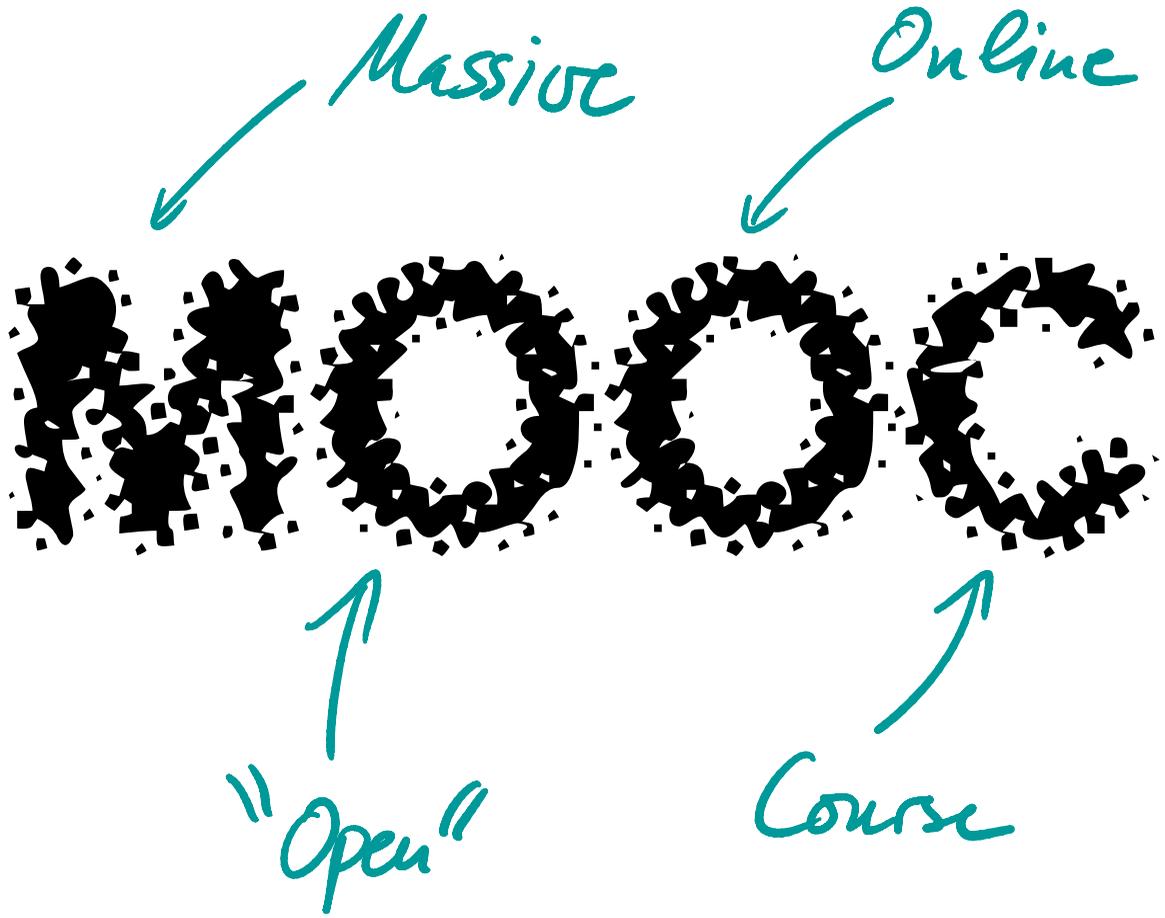
Jörn Loviscach



FH Bielefeld
University of
Applied Sciences

Sinn der Studieneingangsphase

- Kenntnisse und Fertigkeiten angleichen
- ...





<http://cacm.acm.org/blogs/blog-cacm/153706-john-l-hennessy-on-the-coming>

<http://blog.coursera.org/post/55080731561/coursera-secures-43m>

<http://blog.coursera.org/post/67777181974/coursera-receives-20>

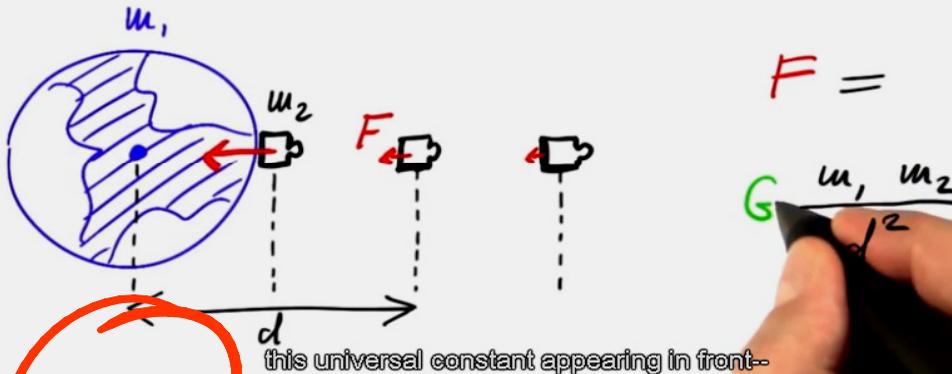
Differential Equations in Action

CLASSROOM



Unit 1 - Houston We Have a Problem

Newton's Law of Gravitation



1:09 / 1:49

Previous

Next

Discussions

See All

Instructor Notes

No discussions for this unit. [See all discussions](#) for this course.

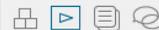
No additional notes for this section

Ask a Question

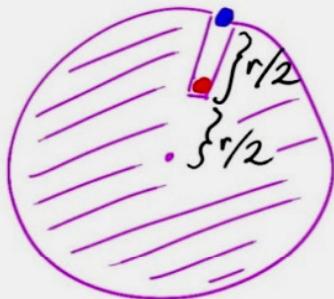
xMOOC

Differential Equations in Action

CLASSROOM



Unit 1 - Houston We Have a Problem ▾



Ratio of
gravitational forces

●	:	●	
1	:	1	⊙
2	:	1	⊙
1	:	2	⊙
4	:	1	⊙
1	:	4	⊙

Force Ratio

Rewatch Instructions

Submit Quiz

Discussions

[See All](#)

Unit1-21: Force Ratio, Force from the shell and Force from the core?

Nov 10

Shell Theorem and water flow analogy

Nov 10

[Ask a Question](#)

Instructor Notes

No additional notes for this section

xMOOC

Differential Equations in Action

PS5-2 Hydraulic Braking - why change if it's desired bounds?

When implementing the brake controller, we want to ensure slip is between majority of the time. This is the relevant part of the official solution:

```
if s < low_slip:
    brake_change = 1
elif s > high_slip:
    brake_change = -1
```

However, this implies:

```
else (i.e. if low_slip <= s <= high_slip):
    brake_change remains as it was, i.e. -1 or 1
```

I find this last part somewhat counter-intuitive if s was, let's say, too low and has in this step only just surpassed low_slip . It already has some "inertia" (its derivative is positive). Then increasing the pressure further will make s overshoot $high_slip$ with an even higher derivative. A symmetric argument can be made for s decreasing past $high_slip$. Therefore, I would argue for the solution

```
if s < low_slip:
    brake_change = 1
elif s > high_slip:
    brake_change = -1
else:
    brake_change = 0
```

Indeed, the car stops in 3573 steps instead of 3723 with this solution. One might however also argue against this solution: it should only work better if s , when "left alone" ($brake_change=0$) will shoot for $high_slip$ very fast in a different setting (or on an analogous control problem), systemic forces might be pushing s (or its analogue) towards 0 (for its analogue) towards the goal of clarity in instructions, making it linger around low_slip all the time, never achieving the ideal slip. However, I tried to get this effect by greatly increasing the admissible slip band to $[low_slip, high_slip] = [0.07, 0.33]$ - surprisingly, the advantage of my "approach" increased (3710 vs 4070 steps for the car to stop).

Any thoughts, comments? I must be missing or misunderstanding something about control systems.

03222 ps5-2 STAFF
edit | close | delete | more

add a comment

4 Answers:

3 Yes, great thinking

My idea was that the two threshold values are so close together that it does not really pay off to have that third rule. Your final "experiment" indeed shows that this third rule gets more helpful as the distance between the two threshold values increases. But one can even get away with using one single threshold value for s : Increase the pressure if s is above that value, decrease the pressure if s is below. It's down to finding the most simple method that is stable under all realistic circumstances. "Obviously" leads to a stable limit cycle. We want to prevent chaotic, fast oscillations. It may not be so easy to see for your method. A nice problem for control theory!

answered 10 Sep 12, 09:35
Jörn Loviscach

reaged 18 Sep 12, 22:07
Sergal #15 #65

asked 10 Sep 12, 08:14
Maja Trampus #2 #45
accept rate: 166%

most voted





- [MEDIATHEK](#)
- [PROGRAMM](#)
- [ÜBER DEN VHSMOOC](#)
- [TEILNEHMEN](#)

Einträge im Forum

umfang

en vhsMOOC-

ation

von LMS?

Der vhsMOOC ist aus...

Posted [Nov 10 2013](#) by [Mark Stockmeyer](#) in [Allgemein](#)

Zumindest die Arbeitsphasen sind abgeschlossen. Vielen Dankeschön an alle Kiebitze, Teilnehmerinnen und Teilnehmer und ein großes Extradanke an unsere Sponsoren. Wir arbeiten an der Evaluation. Ihr könnt alle noch das Forum benutzen. Im News und Evaluation. Ihr könnt alle noch das Forum benutzen. Im News auch in der kommenden Zeit erfahren. Der vhsMOOC ist zu Ende.

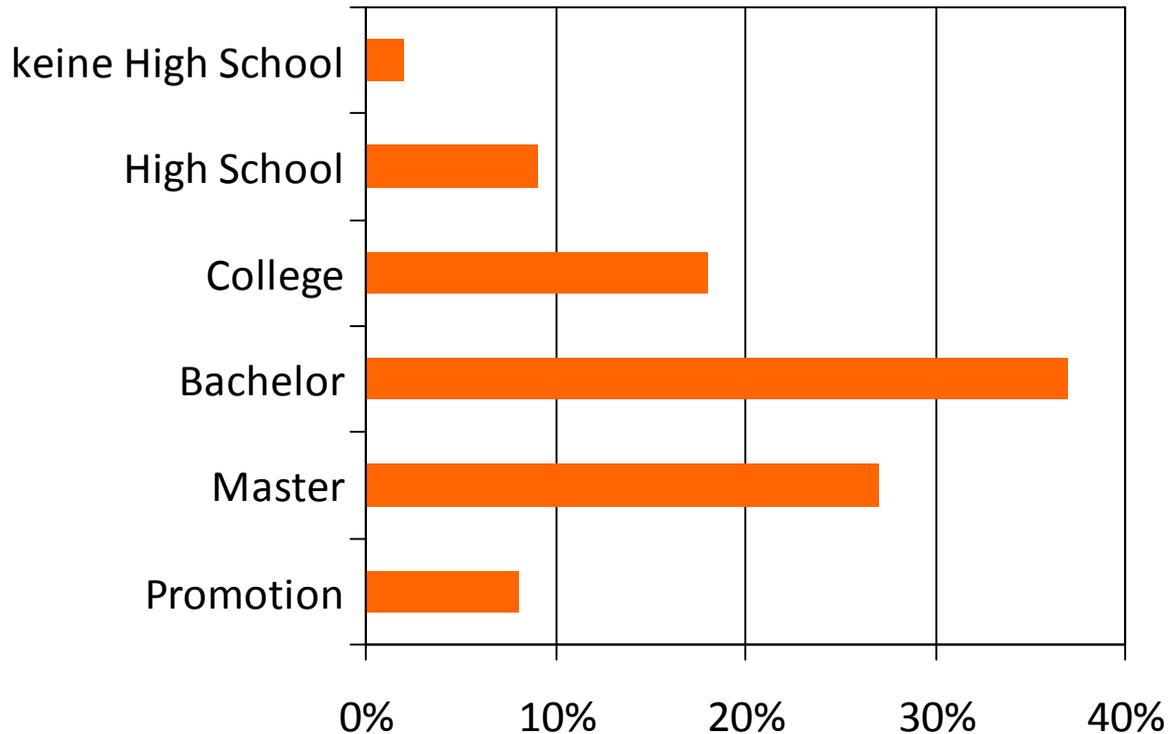
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[vhsMOOC: Ein](#)

A screenshot of a "Public Pad" interface. The title bar says "Public Pad". Below the title bar is a toolbar with icons for bold, italic, underline, strikethrough, list, link, unlink, undo, redo, and search. The main area contains a grid of text, with each row having a number on the right side (e.g., 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111). The text in the grid is mostly illegible due to blurring and color-coding.

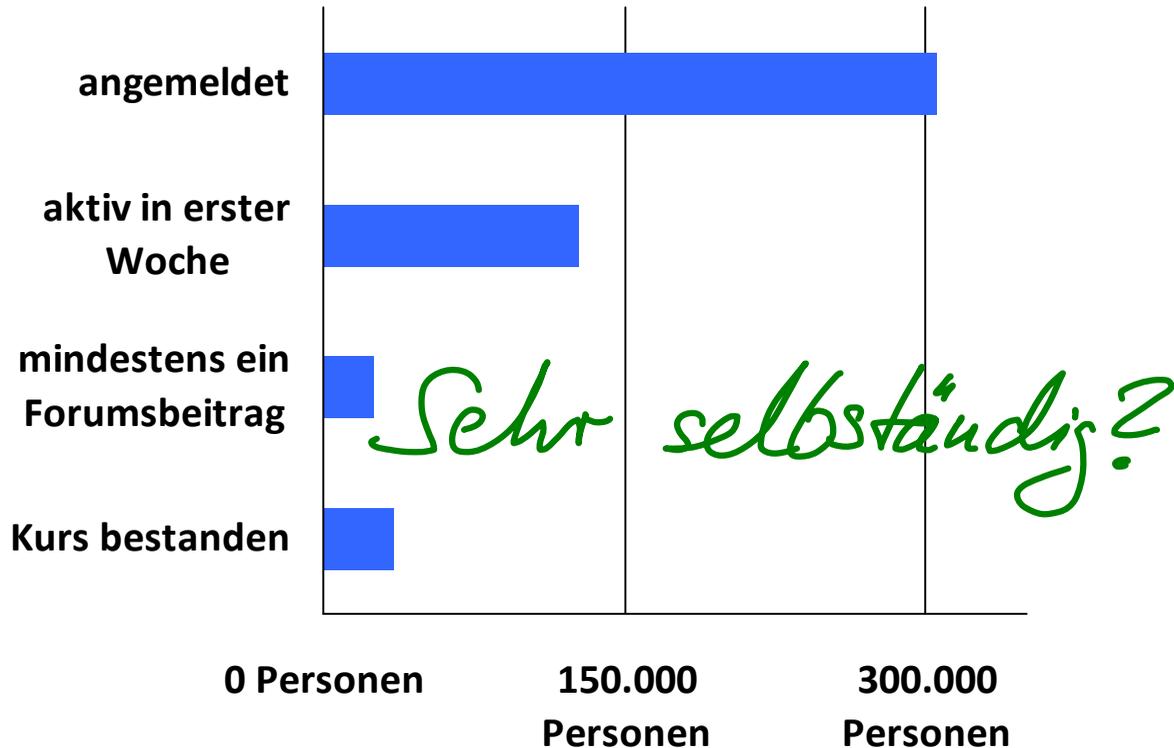
MOOC

Duke University: Bioelectricity



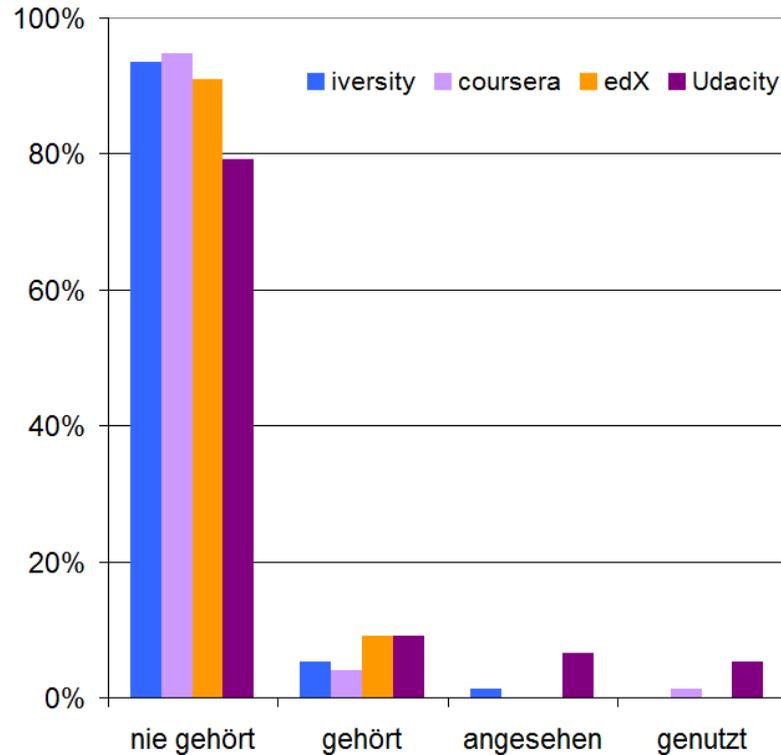
Daten: http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6216/Duke_Bioelectricity_MOOC_Fall2012.pdf

MOOCs der Uni Edinburgh 2013



<https://www.era.lib.ed.ac.uk/handle/1842/6683>

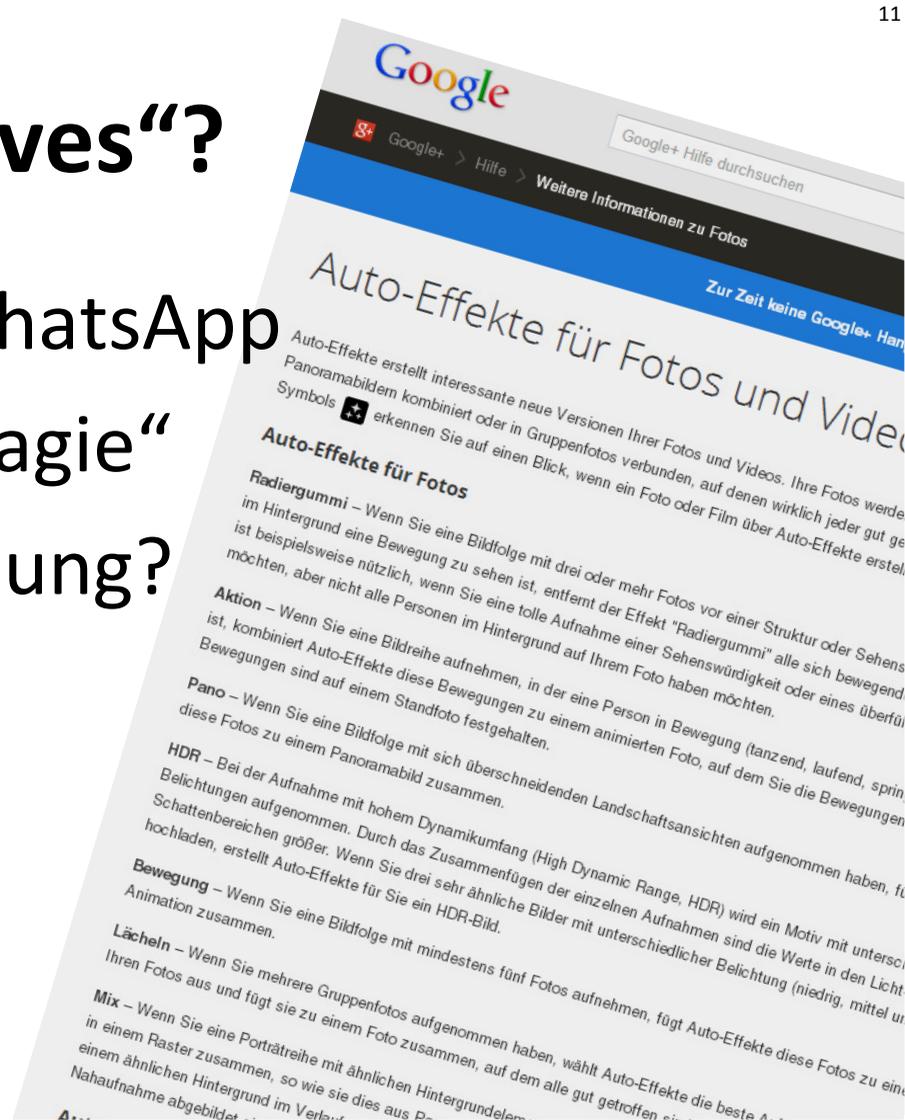
Wer kennt MOOCs?



Umfrage Ende 2013 unter lokalen Bachelor- und Master-Studierenden, N = 77

„Digital Natives“?

- Facebook, WhatsApp
- Software-„Magie“
- Verschriftlichung?
- Illusion des Multitasking



Sinn der Studieneingangsphase

- Kenntnisse und Fertigkeiten angleichen
- ...

Sinn der Studieneingangsphase

- Kenntnisse und Fertigkeiten angleichen
- **vom angeleiteten zum selbständigen Lernen**
- **Arbeit mittels Internet und mit Ressourcen im Internet**

Blended Learning

- sinnvolle Arbeitsteilung:
 - Präsenz:
Dozent(in) und/oder Gruppe
 - Online: Materialien, netzbasierte
Zusammenarbeit/Kommunikation
- Begleiten/Üben des Arbeitens
mit digitalen Medien

Sinnvolle Arbeitsteilung zwischen Präsenz und Online:

Was sind aus Ihrer Sicht
die drei wichtigsten Aspekte?

- Erstsemester nicht vereinsamen lassen
- Online auch in Gruppen
- Aufwand in Didaktik + Präsenz,
nicht in Produktion

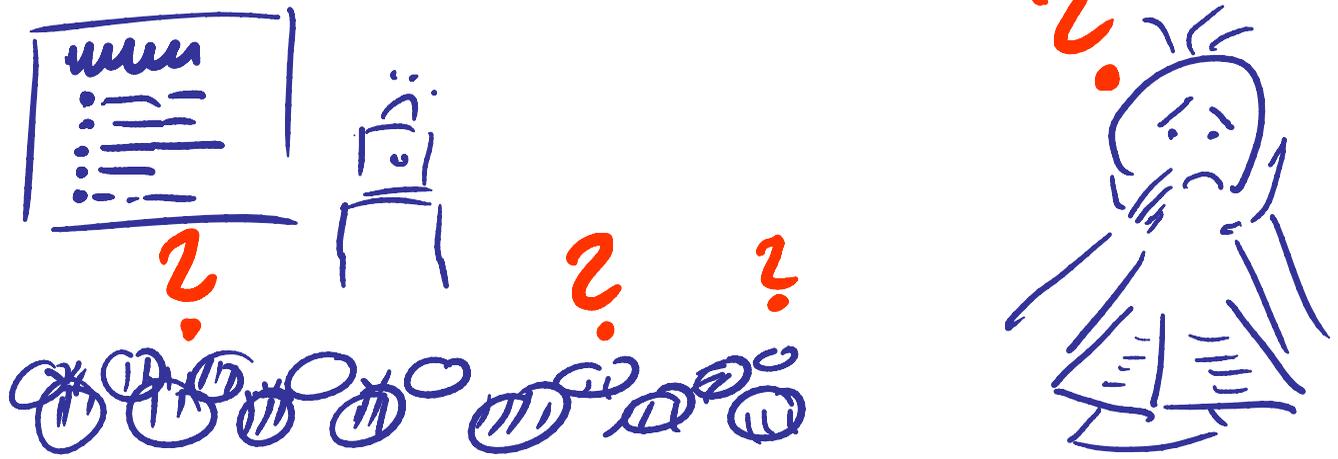
Beispiel: Flipping

an der Hochschule

zu Hause

„Stoff“

üben



an der Hochschule zu Hause
üben, denken, diskutieren „Stoff“

Inverted Classroom Model = Flipped Classroom

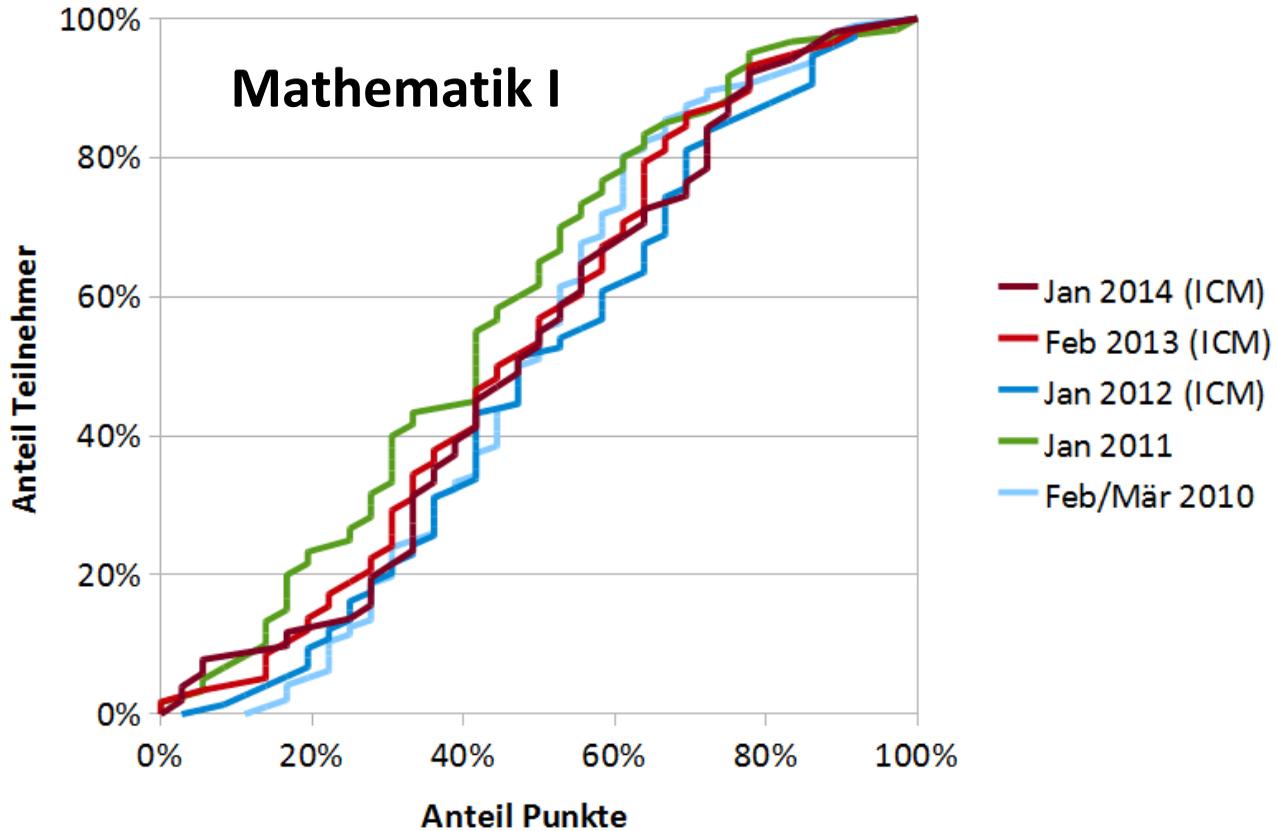
Baker. The Classroom Flip (2000).

Lage/Platt/Treglia. Inverting the Classroom (2000).

Was bei mir klappt

- mehr unmittelbare Rückmeldungen an Studierende / an Dozent(in)
- weniger Facebook und WhatsApp
- mehr Fachdiskussionen zwischen Studierenden
- (etwas) korrektere „Workload“

Klausurnoten?



Warum kein größerer Effekt?

- keine eingebauten Quizze – bisher
- Klausur verleitet zu oberflächlichem Lernen
- auf andere Fächer konzentrieren, in vorlesungsfreier Zeit „nachlernen“

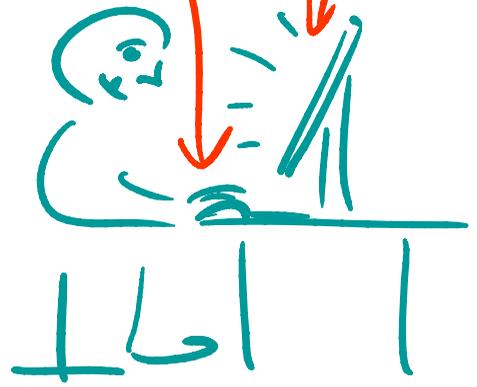


Flipping mit Videos
zum traditionellen Curriculum
als **Ausrede**,
um vom Durchpauken
von „Stoff“ wegzukommen?

Hand auf Maus
kein Facebook
usw.



Lean Back



Lean Forward

In den xMOOCs:

UDACITY Course Catalog My Courses Jörn Loviscach

Differential Equations in Action

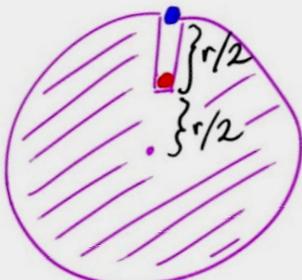
Unit 1 - Houston, We Have a Problem

CLASROOM

Force Ratio

Ratio of gravitational forces

\bullet : \bullet
 1 : 1 ○
 2 : 1 ○
 1 : 2 ○
 4 : 1 ○
 1 : 4 ○



[See All](#) **Instructor Notes**
 No additional notes for this section

[Rewatch Instructions](#)
[Submit Quiz](#)

Formen und Niveaus

Which component is responsible ?

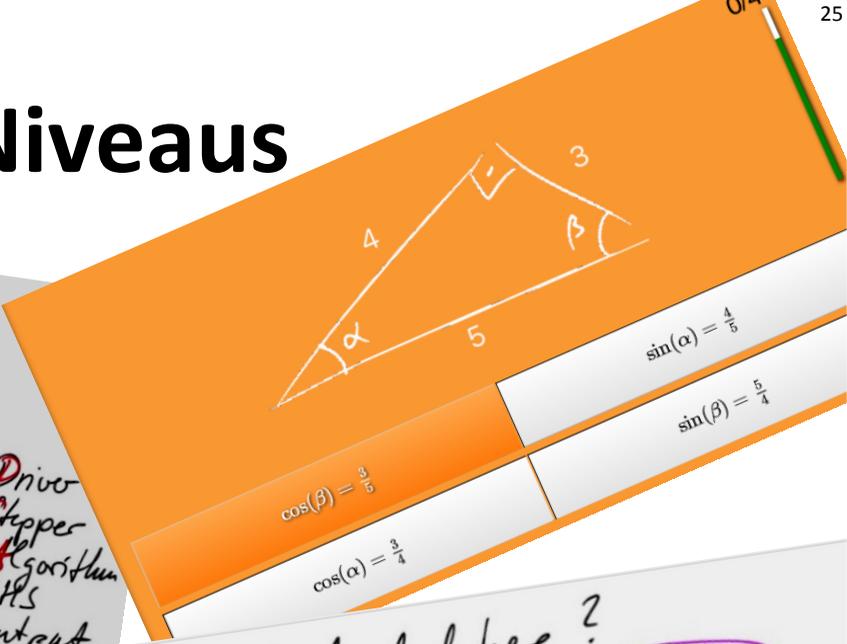
Use an implicit method

Stop at time 42

Determine the value at time 13.000

at a different value for the mass

- Driver
- Stopper
- Algorithm
- RHS
- Output



Which Effect is included here ?

$$\dot{S}(t) = -\frac{5 \times 10^{-9}}{\text{day} \cdot \text{person}} I(t) S(t) + 1000 \frac{\text{persons}}{\text{day}}$$

$$\dot{I}(t) = \frac{5 \times 10^{-9}}{\text{day} \cdot \text{person}} I(t) S(t) - \frac{1}{5 \text{ days}} I(t)$$

$$\dot{R}(t) = \frac{1}{5 \text{ days}} I(t)$$

- Vaccination
- Birth
- Immigration
- Death

Integrierte Quizze

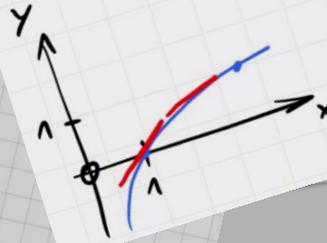
$3^0 = ?$
Rechenregel.
 $(3^0) \cdot 3^4 = 3^{0+4} = 3^4$

Für welche Zahl x gilt: $x \cdot 3^4 = 3^4$?

Ableitung des natürlichen Logarithmus
 $\ln(x)$

$x > 0$

Was ist die Steigung der Tangente des natürlichen Logarithmus an der Stelle $\frac{1}{2}$?



$$1 = \frac{e^{\ln(x)}}{x} \cdot \frac{d \ln(x)}{dx}$$

$$\Rightarrow \frac{d \ln(x)}{dx} = \frac{1}{x}$$

$\frac{x^{42}}{x^{15} \cdot x^{26}} = ?$

0

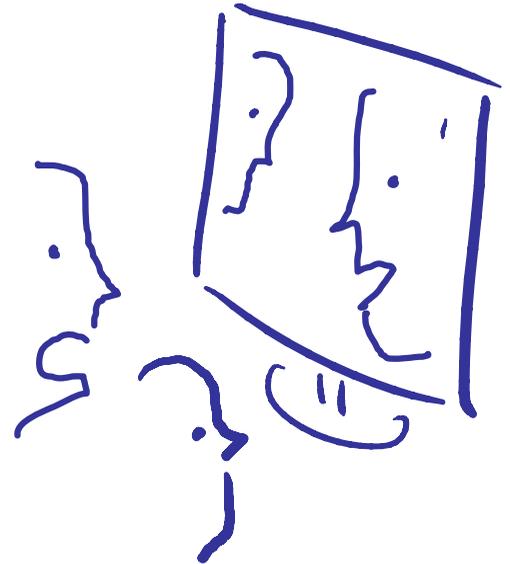
1

 x^2 x 

<http://www.capira.de/>

Videos im Team

- Social Viewing
- Lerngruppen um Videos und Quizze
- Videos von Einzelunterricht in Lerngruppe diskutieren



www.j3L7h.de

