Lessons Learned During Nine Years of Teaching with Video

Jörn Loviscach

FH Bielefeld
University of
Applied Sciences

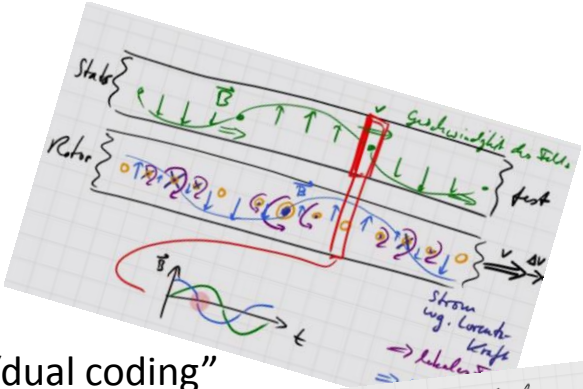
Educational Videos, Online Courses

- **Didactics**
- **Style**
- **Technology**

- **Didactics**
- **Style**
- **Technology**

Why Video?

- In comparison to text:
  - Makes it easier to show and explain processes
  - Employs eyes and ears: “dual coding”
  - Can be (pseudo-)conversational and informal
  - Can be more focused
- Students love it



Addictive Videos

Binged this in just three days,
absolutely to be recommended
(as are the math classes you probably need
before watching this).

Posting (translated) on Twitter about my videos on general relativity (2017)

Student aged 32, pursuing a master's degree in education (mathematics, computer science)

Diversity is a Challenge (as Always)

- A graduate course in psychology or freshmen in electrical engineering?
- Poor strategies for learning

  See, e.g., Karpicke et al. Metacognitive strategies in student learning: Do students practise retrieval when they study on their own? Memory, 2009.
- Notebooks, tablets, and smart phones: accelerators for education or black holes for attention?

Procrastination

"Anytime and anywhere"
may lead to "never ever"
and reduced class attendance.

See for instance:

Tillmann et al. „Das schaue ich mir morgen an" – Aufschiebeverhalten bei der Nutzung von eLectures; eine Analyse. DeLFI 2016.

Edwards & Clinton. A study exploring the impact of lecture capture availability and lecture capture usage on student attendance and attainment. Higher Education 2018.

Binge Learning

Consuming (?) 200 videos
at twofold speed
on the day before the exam
(while chatting on WhatsApp?)

Illusions of Learning

- "Amount of invested mental effort" Salomon

  Schwab et al. Television is still "easy" and print is still "tough"? More than 30 years of research on the amount of invested mental effort. Frontiers in Psychology 9 (2018).

- Preferring recipes and/or entertainment value instead of understanding
- "Easier seen than done"

  Kardas & O'Brien. Easier seen than done: Merely watching others perform can foster an illusion of skill acquisition. Psychological Science 29 (2018).

- Avoiding "desirable difficulties" Bjork & Bjork

Just Watching is not Enough

We estimate the learning benefit
from extra doing (1 SD increase)
to be more than six times
that of extra watching or reading.

Koedinger et al. Learning is not a spectator sport: Doing is better than watching for learning from a MOOC. Learning@Scale 2015.

Essential Didactics

- Retention from reactivation

  See e.g.: MacLeod et al. The mitigating effect of repeated memory reactivations on forgetting. npj Science of Learning 3 (2018).

- Learning by testing

  See e.g.: Roediger et al. Ten benefits of testing and their applications to educational practice. Psychology of learning and motivation 55 (2011).

Videos Plus X

- Online quizzes
- Discussion forums
- Flipped/inverted Classroom

  See e.g.: Lo/Hew/Chen. Toward a set of design principles for mathematics flipped classrooms: A synthesis of research in mathematics education. Educational Research Review 22 (2017).

Aversion Against “Active” Learning

- Studying (!) with videos takes time.
- Quizzes require effort and are frustrating.
- Discussion forums require elaborating one’s questions
- …

All too well-known measures:

Tharayil et al. Strategies to mitigate student resistance to active learning. International Journal of STEM Education 5 (2018).

Examination Regulations

Require or award extra credit for:

- Taking quizzes
- Contributions to discussion forums
- Attendance in the flipped classroom

Are you allowed to do so?
And would it help?

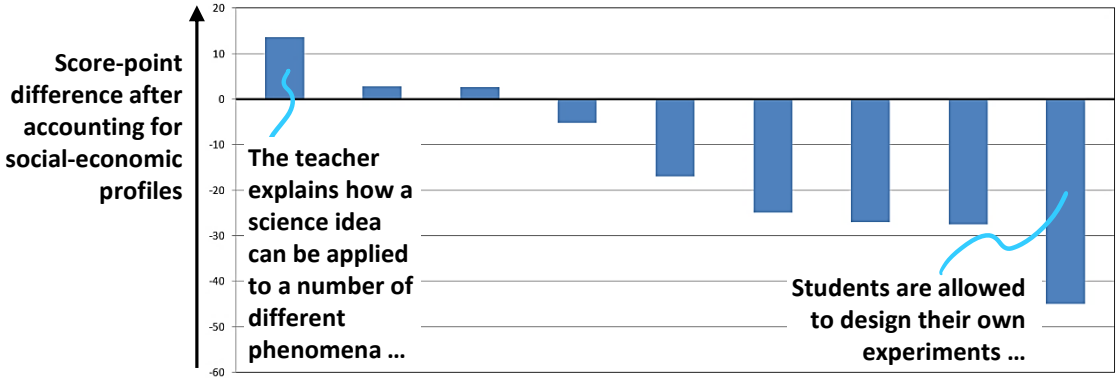
Benefits of Flipped Teaching

- Antidote against obsessive completeness
  Also see: Lehner. Didaktische Reduktion. UTB (2012).
- Liberation of the face-to-face phase in the classroom
- Much more feedback teacher ↔ students
- More focus; fewer smartphones on the desks

Ideas

- Do not record all classes.
- Don’t start with the (boring?) theory.
  Create videos on genuine exam questions;
  cover the necessary foundations in passing.
- Mastery → motivation,
  not the other way around

It's OK to Explain



… in most or all science lessons.

Data: OECD. PISA 2015 Results (Volume II) (2016).

Also see: Kirschner/Sweller/Clark. Why minimal guidance during instruction does not work: an analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. Educational Psychologist 41 (2006).

- **Didactics**
- Style
- Technology

- Didactics
- **Style**
- Technology

Perfection vs. Freehand

Image removed for copyright reasons.

Image removed for copyright reasons.

https://www.youtube.com/watch?v=URUJD5NEXC8

https://www.youtube.com/watch?v=Hmwvj9X4GNY

Much ado vs. hypnotic calmness

Image removed for copyright reasons.

Image removed for copyright reasons.

https://www.youtube.com/watch?v=rf9X-jyJq4w

https://www.youtube.com/watch?v=gBJMt1_xjTM

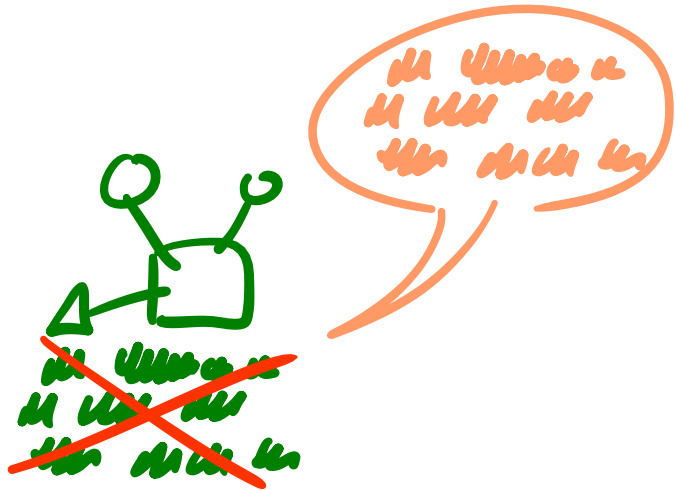
Cognitive Theory of Multimedia Learning

Mayer. Multimedia Learning. 2nd Ed. (2009).

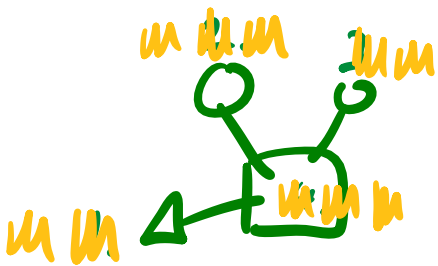
Mayer's Coherence Principle

- Avoid extraneous graphics.
- Avoid extraneous audio.
- Reduction is key.

Mayer's Redundancy Principle

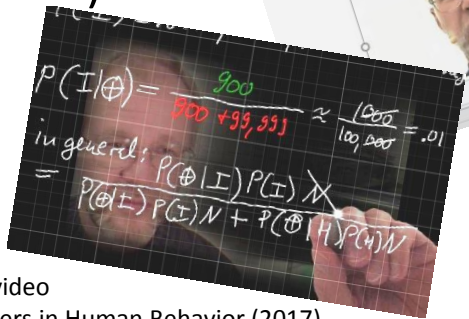


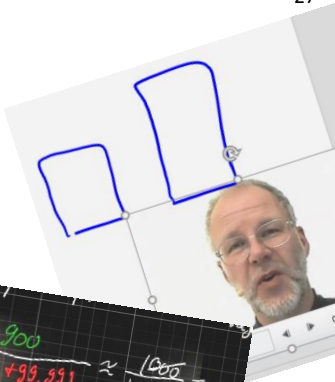
Mayer's Contiguity Principle



Mayer' Image Principle

A talking head does not help much.
(But: much effort in production)





See also:

Wermeskerken et al. Effects of instructor presence in video modeling examples on attention and learning. Computers in Human Behavior (2017).

Stull et al. An eye-tracking analysis of instructor presence in video lectures. Computers in Human Behavior 88 (2018).

Voice

The intonation, the timing,
and the hint of a smile in the voice …
a voice to impersonate the friendliness
of the world in a Brecht drama.

Comment (translated) on my Facebook page (2018)

Analyze and Imitate Popular Videos?

Higher resolution, more static pictures,
more background music, …?

Ten Hove & van der Meij. Like it or not. What characterizes YouTube's more popular instructional videos? Technical Communication 62 (2015).

- Can you measure what makes a video popular?
- How do videos get to the top of the chart?
- Are the popular videos good for learning? (Learning illusion?)

Not Only Explanations

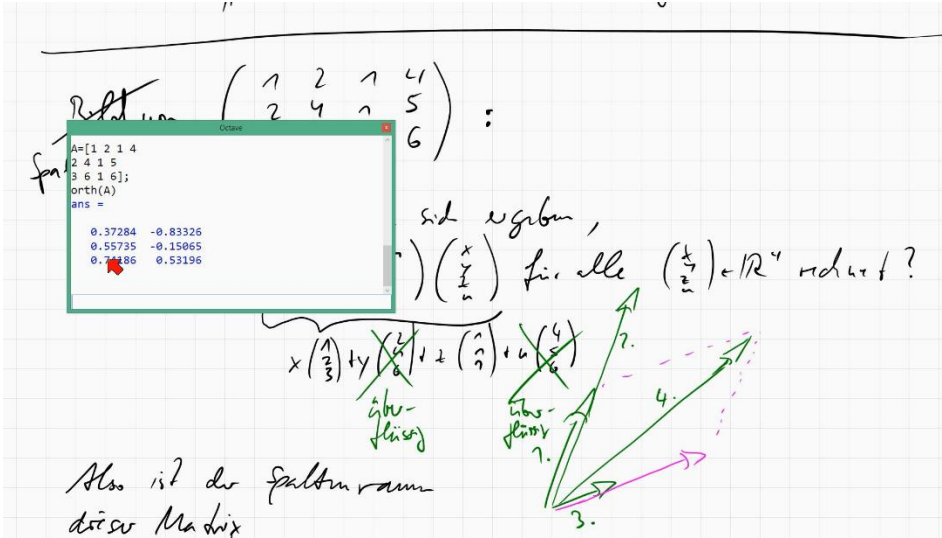
- Worked examples
- Procedures, e.g. for lab
- Discussions, interviews, footage from study trips
- Students working, student work
- Case studies

youtu.be/CqH3-N9DakM

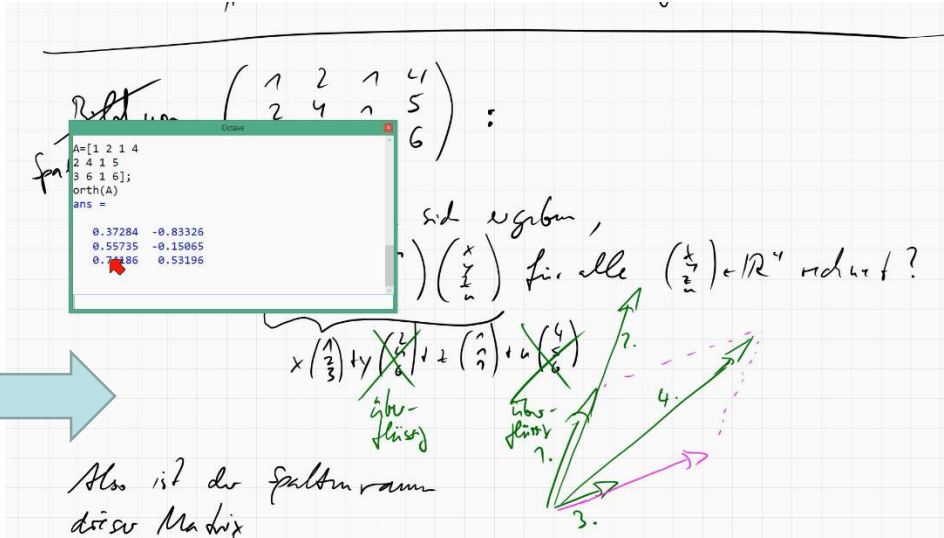
- Didactics
- **Style**
- Technology

- Didactics
- Style
- **Technology**

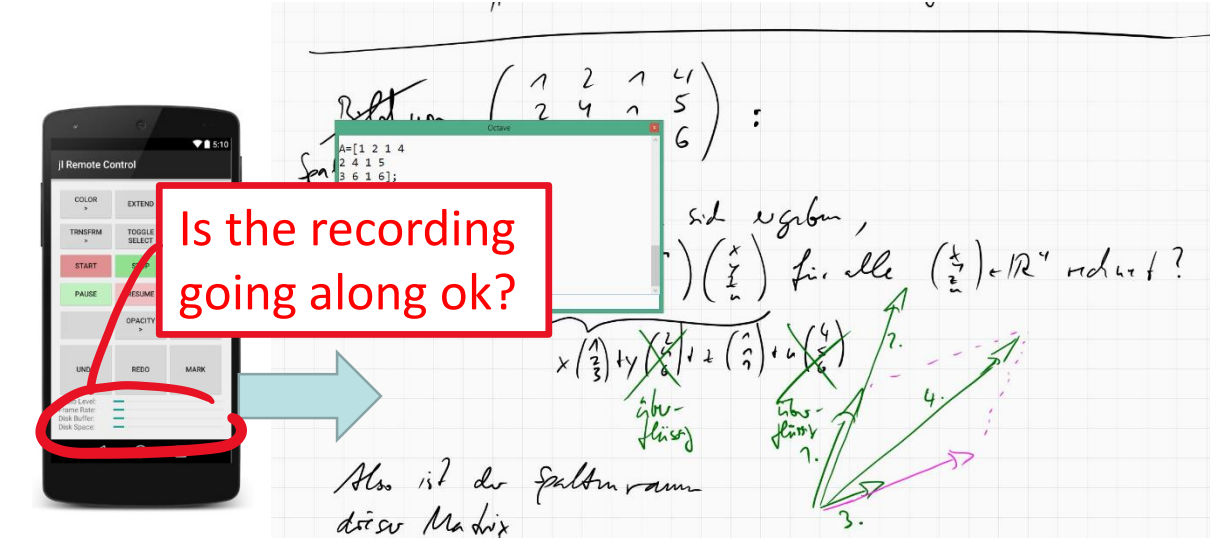
Reduce Distraction



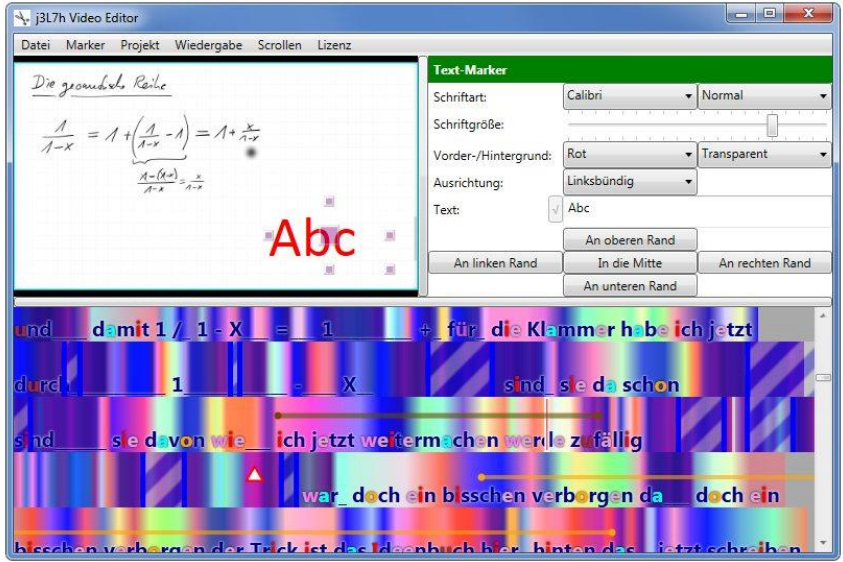
Reduce Distraction



Reduce Distraction



Use Lean Software



www.j3L7h.de/software.html

Use Lean Hardware

My whiteboard and mobile studio 2009–2013:

- 2nd hand Microsoft Tablet PC
- USB microphone

Minimize Video Editing Work

- Train to get rid of smacking and filler words.
- Check the equipment and the sound.
- See to it that no switched-on mobile phones are close to the microphone. Interference!
- Mark edit points while recording.
- Redo the entire sentence that went wrong.
- Prefer pauses over mistakes.

Record in Class

- More focus, hence less editing
- More stage presence, hence more motivating
- Appreciate if students point out mistakes
- Include quizzes and problems;
  look at how the live audience deals with them;
  adapt on the fly

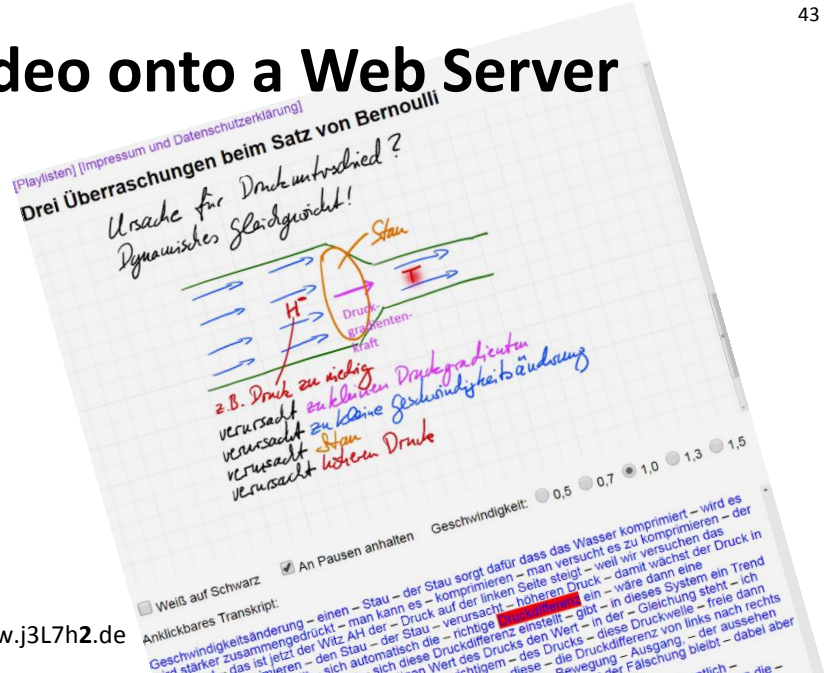
www.j3L7h.de

Appendix

Stay Flexible

- Flipping: feedback from and to students and unhampered choice of approaches
- Technology should be liberating, not confining
- No committee that quarrels about scripts to be filmed in a studio
- Collect, improvise, share small exp**a**ndable and exp**e**ndable units

Just Put Video onto a Web Server



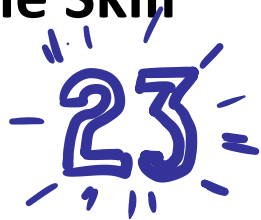
www.j3L7h**2**.de

Some Hairy Problems

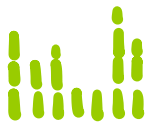
- Keeping track of rights:
  It's far easier *not* to use images etc. made by and/or depicting other persons.
- Long-term maintenance: What do you do if you find a mistake in a video that's five years old?
- Accessibility: What about students with vision or hearing impairments?

Drawing is a Trainable Skill

- Comics



- Information visualization (Tufte)



- “Graphic recording”

Turn Recorded Questions into Quizzes

Embedded quizzes with H5P

mooin.oncampus.de

Open Questions

- Ask a simple question, pause for two seconds: Enough for testing effect?

  See also: Merkt et al. Pauses in educational videos: Testing the transience explanation against the structuring explanation. Computers in Human Behavior (2018).

- Learning vocabulary & pronunciation; (bad?) manners of speaking, drawing, thinking, teaching?
- Motivational effect on a grander scale?