

The Teaching Trick

**– how to improve student learning
without spending more time teaching**



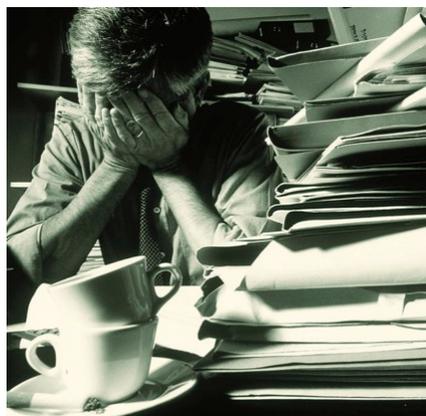
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Cost-neutral interventions

To persuade the grumpy professor to listen



To support those dedicated to teaching





**Anyone can improve a course
(at least some little bit)
by working 100 hours more...**

Yeah. We don't have those hours.

**And "more of the same" is probably
not the most effective strategy
either...**

We want to **improve (maximise) student learning**
with a given (or reduced) level of
teaching resources


$$\eta = \frac{\text{Output}}{\text{Input}}$$

**Then we need
pedagogical know-how!**

Pedagogical competence



1. setting clear objectives

(intended learning outcomes)

- relevant for the study programs
- defining the threshold level of quality
- deeper working understanding

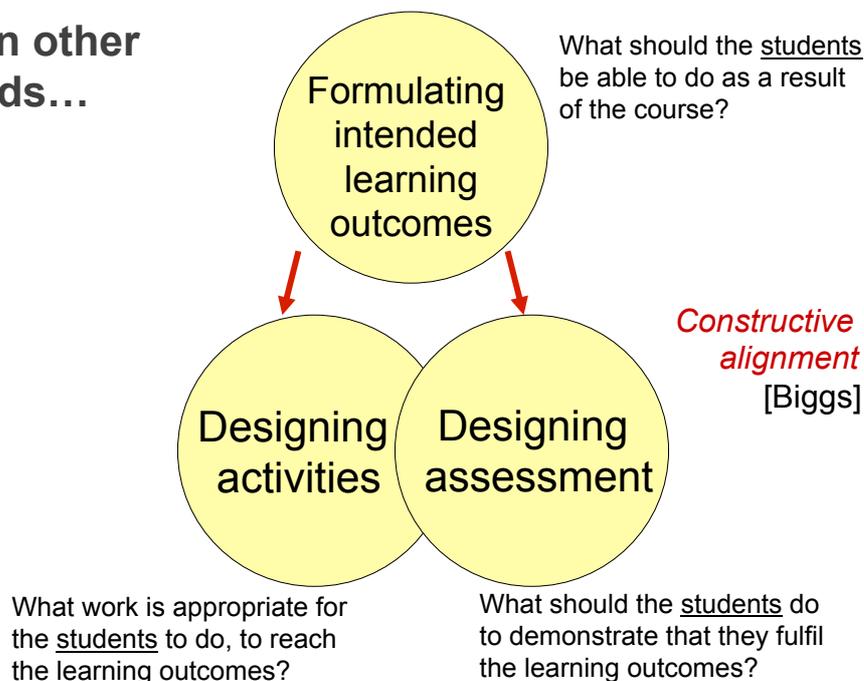
2. uphold the threshold level of quality

- only pass the students who reach the goals

3. create a course which generates appropriate learning activity

- so students actually reach the goals
- good throughput - with good quality

Or in other words...



Pedagogical competence



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4. and doing this while using teacher time effectively

- generate appropriate study for the students
- spend your time where it has effect on learning
- create a sustainable workload for yourself
- and sustainability for your institution and country

The teaching trick

**Do more of that which
contributes to learning**

Pretty easy

But since we don't have 100 hours more:

**Do less of that which
does not contribute**

Pretty hard

Which one is easier and which one is harder?

Examples are illustrations of principles

A specific
example

will
illustrate



generic
principles to inspire

applications
- of many
different kinds.

Pick one!



/* No comments */

Family dinner

Invest 0,20 €

Seven minutes

Master test

Fireworks

maybe later:

Ultimate frisbee

/* No comments */

The teaching trick:

Do less of that which does not contribute

**Spend less time on...
"finishing" student work!**



Professor S told us:



"I got **60 reports**. It is a boring task to give feedback and it **takes me two weeks**.

I **gave individual comments** and asked those who had failed to re-submit.

When the reports came back they were still bad. The students had only corrected the things I specifically commented on. They did not even read the rest!

Next year I did not give individual feedback on failed reports. Instead I **made a list with the most common errors**. Now the students had to **find their own errors**. When I got the reports back they were **generally very good!**"

Remember the purpose

- The purpose **is not** that *this particular* report should be good
- The purpose **is** that the **student should develop the skills** to write reports (so that he/she can write 1000 excellent reports later)



For the same reason:

Keep your hands on your back...

when you are assisting students in the computer lab
– do not ever touch their keyboard!



Every time you tie the shoes for your child, you hinder her own development.

Maria Montessori



Family dinner



The teaching trick:

Do less of that which does not contribute

**Spend less time on...
marking coursework!**



Here comes the trick: Easy marking 😊

Grading scale

- Fail = 0p (Seldom happens)
- Pass = 1p (Typical grade)
- Brilliant = 2p (Requires lots of own initiatives)
- + With accepted participation in the feed-back loop +1p

Easy to see the difference between 0, 1 or 2 points, in fact it only takes about 1-3 minutes per paper...



At the end of the course, points are converted to final grade (no exam)

+ In some courses there is also an oral exam

Points	Grade
25-28	A
21-24	B
17-20	C
14-16	D
11-13	E
0-10	Fx

The principle is to separate the processes

– then both can be made cost-effective

Feedback for learning

- made into a group learning activity
- intense involvement
- learn to discuss the subject
- immediate feedback
- expose variation
- social motivation

Assessment for grading

- by the teacher
- minimalistic
- sufficiently fair

Good for learning!



Continuous studies

- Distributes student effort during the course.

The formative feedback session *as a whole* (giving feedback, getting feedback and discussions) **generates learning:**

- Repetition – Variation – Fast feedback.
- Deep & interesting discussions (instead of discussions on definitions).
- Social motivation – expose your understanding to others and see theirs.

Satisfaction:

- Students feel that the teacher really cares about their work.
- Clear, fair and transparent grading system.
- Students feel their progression.

Good for the teacher!

- ≈1-3 minutes per paper.
- Final grading is no extra work 😊

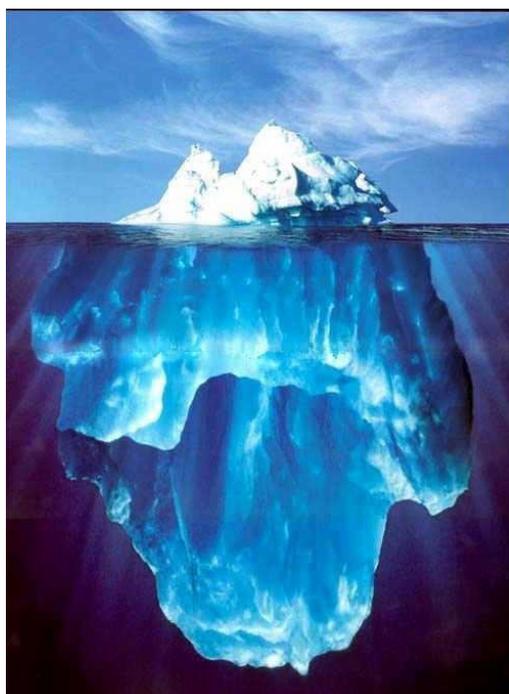
Invest 0,20 €



The teaching trick:

Do less of that which does not contribute

**Spend less time on...
learning activities that don't
generate appropriate study!**



The Iceberg Principle

Group work with
random presenter

Tell them on day one:
All students in the group should
be ready to present the whole
project and take questions on
all parts

Last minute:
Choose the presenter randomly

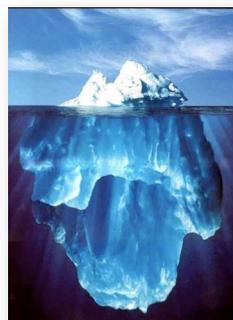
Students choose

- It is possible to hide behind strong students
- There is little incentive to learn about each others work
- Only the best presenter will practice presenting
- Towards the end it is mainly the presenter who is working



Random choice

- Everyone knows you cannot hide
- Everyone must learn about all parts
 - what questions can we expect to get on X?
 - why did we choose to Y?
- Everyone will practice presenting



What is the cost?



About 0,20 €



The real cost is explaining the setup for the students

Some students will say:

- *It is unfair!*

You explain:

- *It is. But, you see, the previous setup was unfair too. But now the learning will be much better for all!*

Seven minutes



The teaching trick:

Do less of that which does not contribute

**Spend less time on...
designing and correcting exams!**



Oral exams are really good for learning

- Better **test of understanding** & can be individually tailored
- **Affect student preparation** – they know they have to show "real" understanding, in real time (create the right expectation)

Some teachers are nervous about...

...inventing the necessary questions

- The trick: Reverse the burden of proof
(*"the first 7 minutes are yours, to show me that you have reached the learning outcomes"*)
- Follow-up questions will pop up!

...grading

- Use a simple scale: Fail / 10p / 20p

...having to fail students

- Photograph the written start for documentation
- Ask kindly how they think it went

...the time it takes

- But it is cheaper for a course of up to N students
- What is N for your course? Do the math!



Katrin taking an oral exam

Written- vs oral exam, teacher time

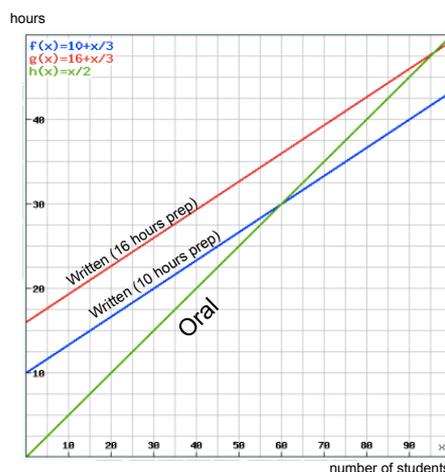
Written:

Design and construction of exam and solution-sheet takes \approx **10-16** hours.
Correcting one exam takes \approx **20** minutes

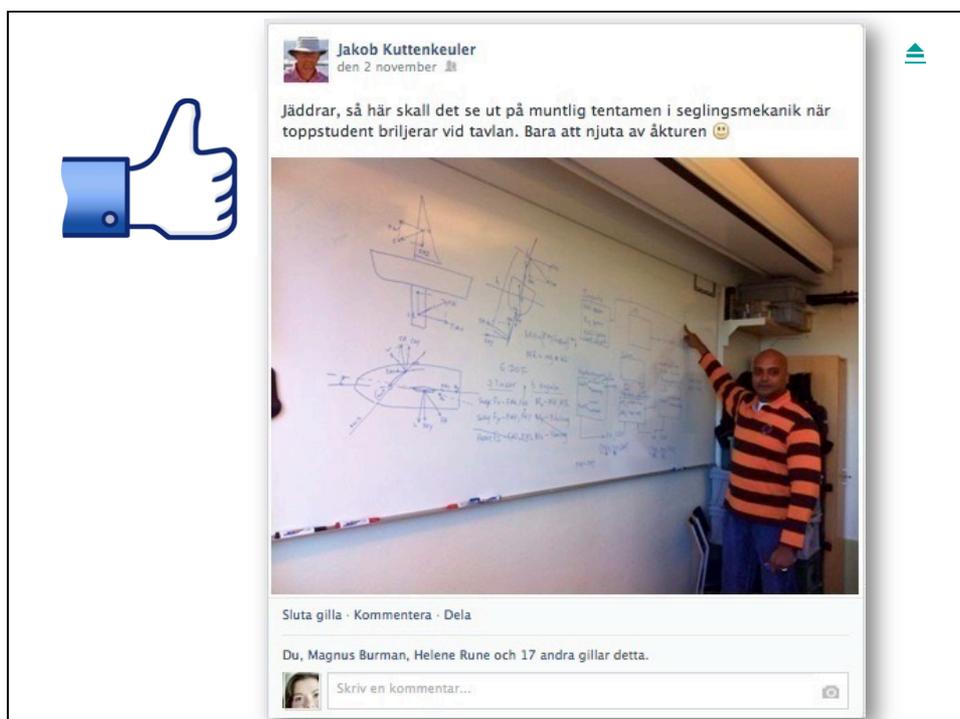
Oral:

The exam takes \approx **30** minutes.

**Moreover:
Consider the
gain at re-exam!**

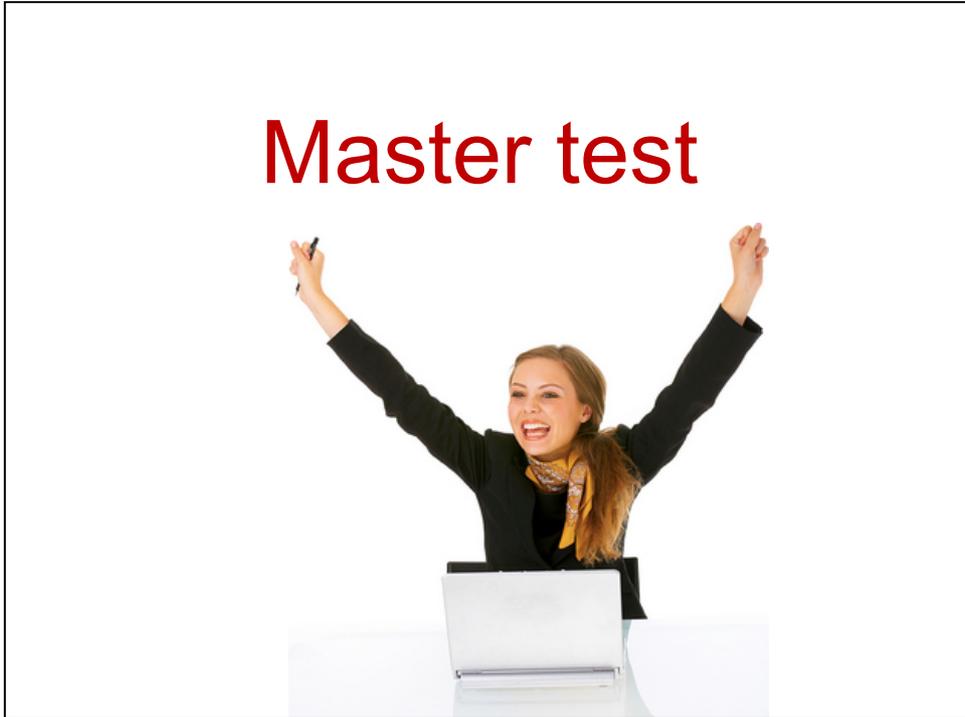


*"We have 400 students in Introductory Physics...
but we also have more than 10 professors
who know the subject!"*



A screenshot of a Facebook post. On the left is a large blue thumbs-up icon. The post is by Jakob Kutenkeuler, dated November 2nd. The text of the post reads: "Jäddrar, så här skall det se ut på muntlig tentamen i seglingsmekanik när toppstudent briljerar vid tavlan. Bara att njuta av åkturen 😊". Below the text is a photograph of a man in a red and black striped shirt pointing at a whiteboard filled with complex physics diagrams and equations. The whiteboard contains several diagrams of a boat's hull and associated force vectors, along with mathematical formulas. Below the photo, the post shows interaction options: "Sluta gilla · Kommentera · Dela", a notification "Du, Magnus Burman, Helene Rune och 17 andra gillar detta.", and a comment input field with a camera icon.

Master test



The teaching trick:

Do less of that which does not contribute

**Spend less time (energy) on...
listening to students complaints!**



Before:

There were two individual assignments in the course:

- **Homework 1 & 2**

The tasks were complex and theoretical...

Students complained bitterly and endlessly:

- *The assignments come too EARLY before we know how to do this!*
- *They are far too DIFFICULT and take TOO MUCH TIME!*

**What Professor V did:**

The assignments were renamed:

- **MASTER TEST 1 & 2 (MÄSTARPROV)**

What happened?

- Complaints just stopped
- Students take the assignments very seriously – and are very proud!



...other interesting words...



Accident	Evaluation	Time out	Certificate
investigation	Summit	Grand challenge	Jam session
Weekly challenge	Negotiation	Dress rehearsal	Dissection
Show	All hands on deck	Opening	Hackathon
Master test	Campaign	Court hearing	Talk show
Demonstration	Consultancy	Stop-press	Level up
Gymkhana	Pitch	Workout	Expert panel
Show & Tell	Elevator pitch	Personal training	Investigation
Fair	Pecha kucha	Vernissage	Workshop
Keynote	Speed dating	Hearing	Emergency room
TED talk	Match	Review	Launch
Potluck	Audition	Test pilot	Countdown
Conference	Ceremony	Advisory group	Pit stop
Deadline	Installation	Working party	Meeting
Inspection	Inauguration		
Q&A session			

Fireworks



The teaching trick:

Do less of that which does not contribute
(especially if it is expensive)

**Spend less time on...
writing feedback**



Tax payer's money down the drain!



Make the distinction between:

- feedback for learning
- justification of grade
(does not generate learning, minimize cost)

~ 40 students write an open-ended assignment of 4 pages

(e.g. essay, design,
reflection...)



- The assignment is personal and important (a credo).
- It would take several days to write good feedback!
- Instead a final seminar
 - Intensive learning activity
 - Plenty of peer feedback and some from the teacher
 - Minimal summative assessment, sufficiently fair (pass/fail grade)



- The teacher skims essays and makes quick decision:
 - **Accepted** to join the seminar
 - **Pending acceptance**, allowed to join but must submit improved version after the seminar (and they must tell the group and ask for guidance)
 - **Reject**, cannot join and must redo assignment the next time the course is given
- Divides the students in groups of 4
(Usually one excellent essay, two medium good, and one needing improvement)
- Sends mail with instructions
 - **Download** your colleagues' work (from the digital platform).
 - **Write ½ page constructive comments** to each colleague, *strong aspects and how the work can be improved*.
 - **Bring** prints of comments to the seminar
(4 for the group + 1 to the teacher).
- This takes maximum 2 hours...

Teacher prepares feedback before the seminar

- Merges all essays into one big pdf.
- Searches for **a strong aspect** in each text, making sure to cover the things that are important in the course.
- Marks the passage with a "star" in the margin with some keywords.
- This takes just as long time as a hockey game 😊



[Recommending the GoodReader app for annotations]

At the seminar – group feedback

- Discuss each essay with the aim to improve it (4*30 minutes).
- Meanwhile, the teacher reads the written comments (to see that they were taken seriously + as input)
- Their feedback is quite useful
 - Students are really good at pointing out deficiencies
 - Getting three different comments on your essay is great



End with fireworks



1 hour in plenary:

- Display the pdf and discuss each "Gold Star" full of enthusiasm and passion (fireworks). Bring it on!
- End by recommending 3 – 4 essays to read before writing version 2.0 (for most students it is voluntary).
- Publish the pdf in the digital platform as an invitation to browse.



Ultimate frisbee



Dear Professor,



I coach the women's **ultimate frisbee teams** and based on your workshop I changed our program for the **practice weekend**.

Normally, since a game only involves 14 players, we would rotate and the others would do some drill on the side.

Now, instead, I had a non-playing team standing on the sidelines and assigned each of them a player. Then I stopped the game periodically and had the sideline players give individual feedback to their assigned player.

It went over remarkably well. A number of the ladies had very positive feedback, and said they had numerous strategy talks that they found incredibly helpful. It was also great for me, since I can't possibly watch every player all the time. It was incredibly time efficient!

So in conclusion, thanks again for the workshop. I thoroughly enjoyed it, and I thought you might like hearing about an application in a completely different "field"!

Best regards,
Professor D

The trick question

Do more of that which contributes to learning *Easy part*
(especially when it is cheap)

Do less of that which does not contribute *Hard part*
(especially when it is expensive)

Doing additional things on top of the old is not sustainable...

So why do we often keep doing things that are less effective for learning?

Discuss with your neighbours

• •

What reasons can there be...?

- Convenience – if I use traditional methods, there is no need to think, to make decisions, to explain, to defend, to persuade, to take responsibility...
- It is true – we actually never thought of this because we truly believed that it would always take more time
- Student expectations (or what we think they want)
- Colleagues expectations (or what we think they think)
- We teach in ways that make us feel good ourselves (lecture, have answers to everything, finish student work so it looks good...), without thinking so much about learning
- We have not reflected on our routines and traditions
- Lack of knowledge and fantasy in course design
- We think education is more about sorting people than adding value
- We actually think that everything is the students' fault
- Minimising risk:
“when the old model doesn't work, it is the student's fault,
but if I try something new and it doesn't work, then it is all my fault”

Remember that we are here to
improve education



The tricks are not just “oil in the machinery”

More importantly they imply

QUALITY TIME WITH YOUR STUDENTS

- more meaningful and fun, because it is value adding!



How to talk with students about this

NEVER SAY:

this is “alternative” – I learnt a trick – I’m saving my time 🤖

Show that this truly belongs in the education

Several tricks address competences relevant for most educational programs. Make this explicit in the learning objectives!

After the course you should be able to (for instance)

- evaluate your own work and the work by others...
- critically analyse and give feedback on...
- critically assess alternative solutions...
- orally present and discuss your conclusions and the underpinning knowledge...
- argue and contribute in discussions about...

Student: *Why do I need to read their report?*

Teacher: *Look at the course learning outcomes. This is how you practice to...critically review and give feedback on technical solutions! You will need that in working life.*

It is also about a more stimulating role for teachers

Value-adding processes are often more stimulating

The least value-adding processes are often boring routine tasks



Also note that the most value-adding processes
are the last to be replaced...



My hidden agenda

Enabling educational development
by addressing the implementation



Furthering a learning perspective
by gift-wrapping it



And we only live once...



Now let's discuss...



- What do students need more of?
- What do you want to do more of?



- What do you want to do less of?

Topics for tomorrow – thoughts and priorities?

- Principles for better learning and more effective teaching – subject courses
- Principles for better learning and more effective teaching – project courses
- Program development

Homework for tomorrow (about 30 min)

Please read - Graham Gibbs (1999) *Using assessment strategically to change the way students learn*

- Read carefully **pages 43-47** “A case study in cheap and effective change” with **analysis**. Note especially the **five principles** that are marked in the copy. We are going to work on these tomorrow.

+ if you are interested: Chickering & Gamson: *Seven principles for good practice in undergraduate education*

- This is a little gem, mentioned in the Gibbs article.

Good evening and see you
tomorrow!