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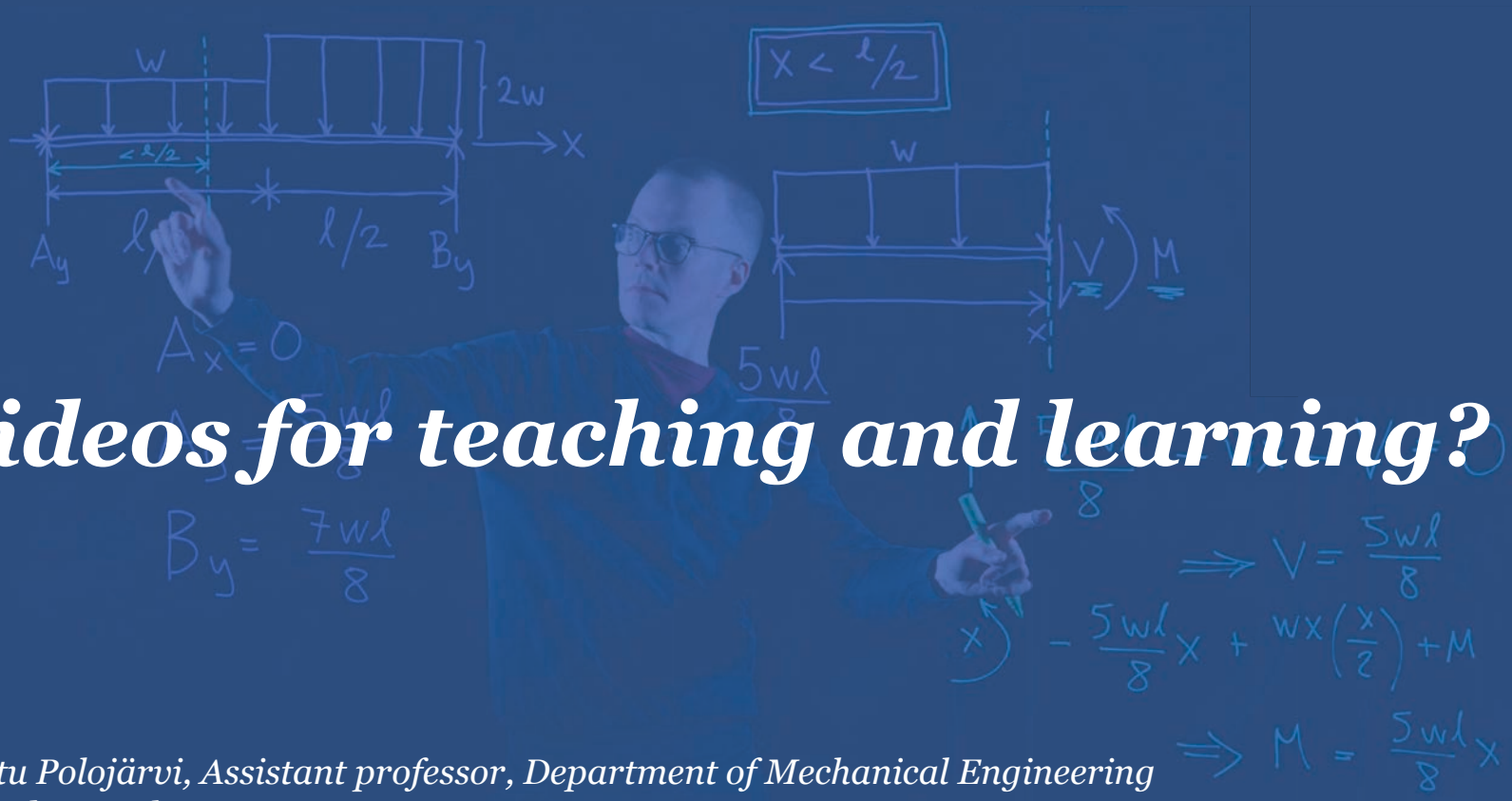


Videos for teaching and learning?

Arttu Polojärvi, Assistant professor, Department of Mechanical Engineering
A!Peda, October 23, 2018

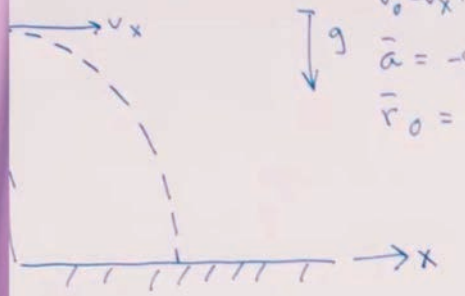
Introduction and background

- I teach applied mechanics and ice mechanics:
  - Have taught on 7 different courses (14 times in total)
  - Courses on bachelor, master and doctoral level
  - Fairly challenging courses – fairly good feedback
- Videos were for BSc-level course KJR-C1001:
  - Basic mechanics course, ~150 active 1st year students
  - Student feedback and limited facilities made me do it
  - Thanks to “online assignments and assessment”-course

What were my goals?

Needed a replacement for examples allowing…

1. students to engage to learning activities at anytime.
2. to clearly present some key concepts of the course.
3. me to not get killed by the increased amount of work.



$\bar{v}_0 = v_x \bar{i}$

$\bar{a} = -g\bar{j}$

$\bar{r}_0 = h\bar{j}$

$$\bar{v}(t) = v_x \bar{i} - gt\bar{j}$$

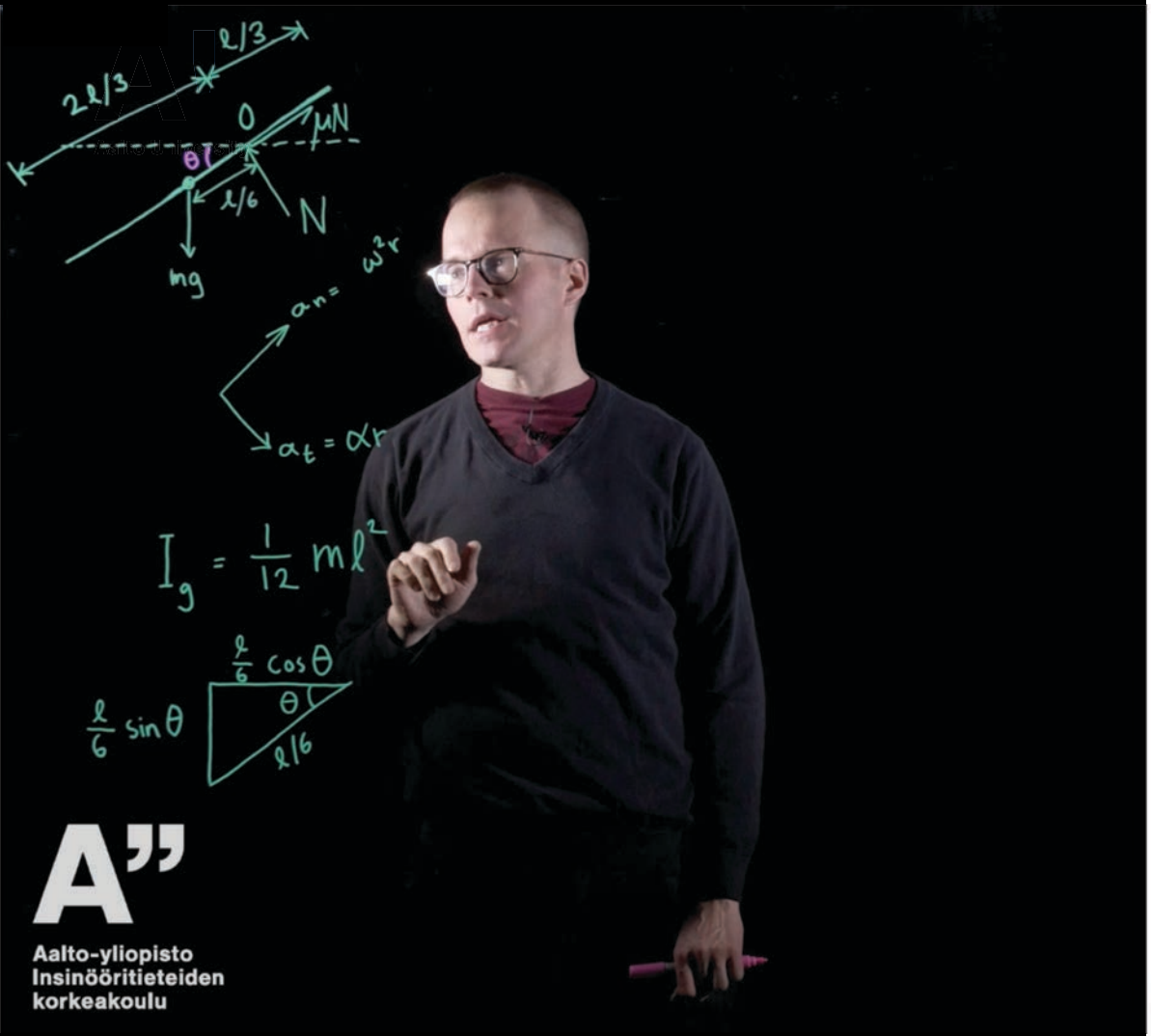
$$\frac{d\bar{r}}{dt} = \bar{v}(t) \Rightarrow d\bar{r} = \bar{v}(t)\,dt$$

$$\int_{\bar{r}_0}^{\bar{r}(t)} d\bar{r} = \int_0^t v_x \bar{i} - gt\bar{j}\,dt$$

$$\bar{r}(t) - \bar{r}_0 = v_x t \bar{i} - \frac{1}{2} t^2 \bar{j}$$

$$\bar{r}(t) = v_x t \bar{i} + h\bar{j} - \frac{1}{2} g t^2 \bar{j}$$

$$h\bar{j} - \frac{1}{2} g t^2 \bar{j} = 0 \Rightarrow t = \sqrt{2}$$



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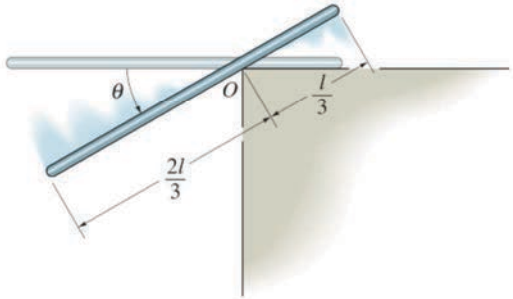
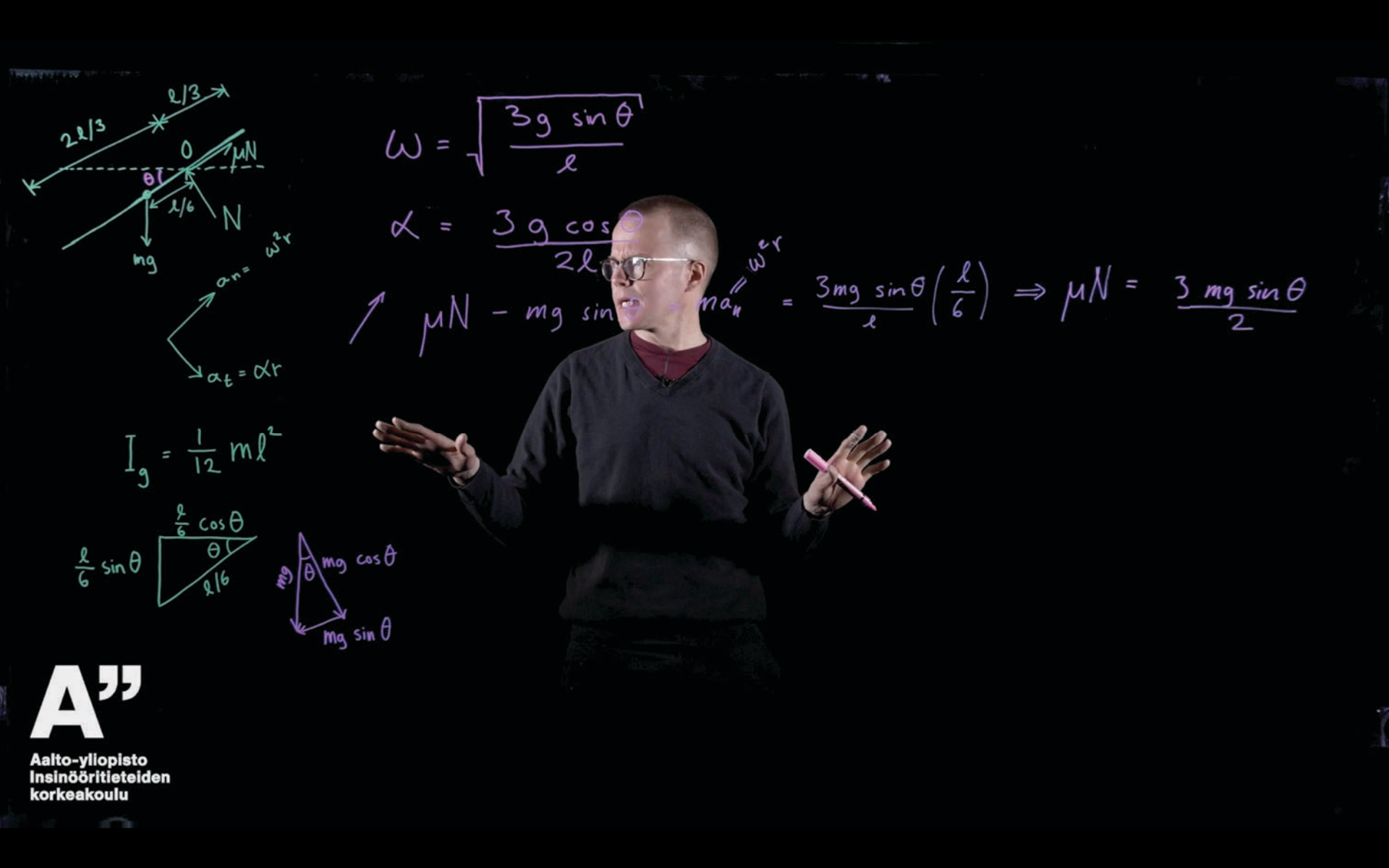
Kallistuva kepukka (osa 1)

Kuvan homogeeninen sauva (massa m, pituus l) lähtee levosta asemasta $\theta = 0$ ja alkaa kallistumaan painovoiman vaikutuksesta (putoamiskiihtyvyys g alaspäin). Millä θ:n arvolla sauva aloittaa translaation (alkaa luistamaan) pituusakselinsa suunnassa, kun sauvan ja alustan välinen kitkakerroin $\mu = 0.3$.





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Added value for the teacher?

- Cost-benefit ratio for engagement is good!
- Ease of describing “engineering-thinking”
- Allows diving into the details when needed

- Benefits of using lightboard in teaching:
  - Demonstrating is easy with the lightboard.
  - You are present and close to the student.
  - Afraid of the camera? Well, you do not see it!
  - Only limited amount of preparation needed.

Added value for the students?

- One can always engage to learning activities
- Each students can choose a suitable pace
- Students love learning mechanics from example

- Benefits of using lightboard for students:
  - Body language appears to be important for some
  - Attention is drawn to actual doing all of the time
  - Simply put: the lightboard just looks pretty cool!

Added value for the students?

“You can see well how to solve problems (you only learn from example) …”

“… I could watch a bit of the video and pause it, and try to solve the problem …”

“Videos were often thorough and I knew most of the things, which made them a bit boring.”

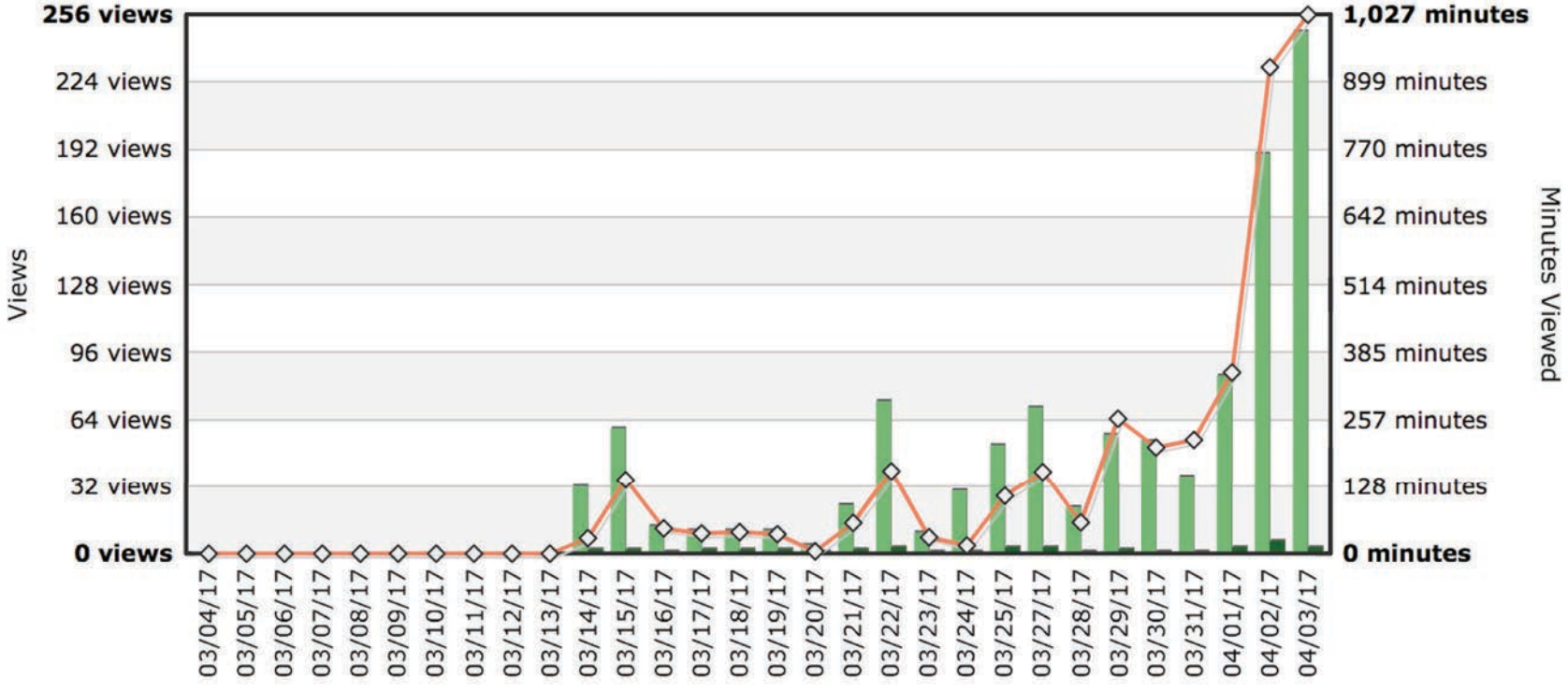
“Demovideos were very well made and really informative.”

“Demovideos were the best thing ever!”

Some statistics on videos…

- 2017 I uploaded the videos for the first time:
  - Very positive student feedback without asking.
- 2018 I uploaded more videos (of both types):
  - Videos were watched for over 220 hours (> 9 days).
  - Peaks right before exams and returning exercises.

Some statistics on videos...



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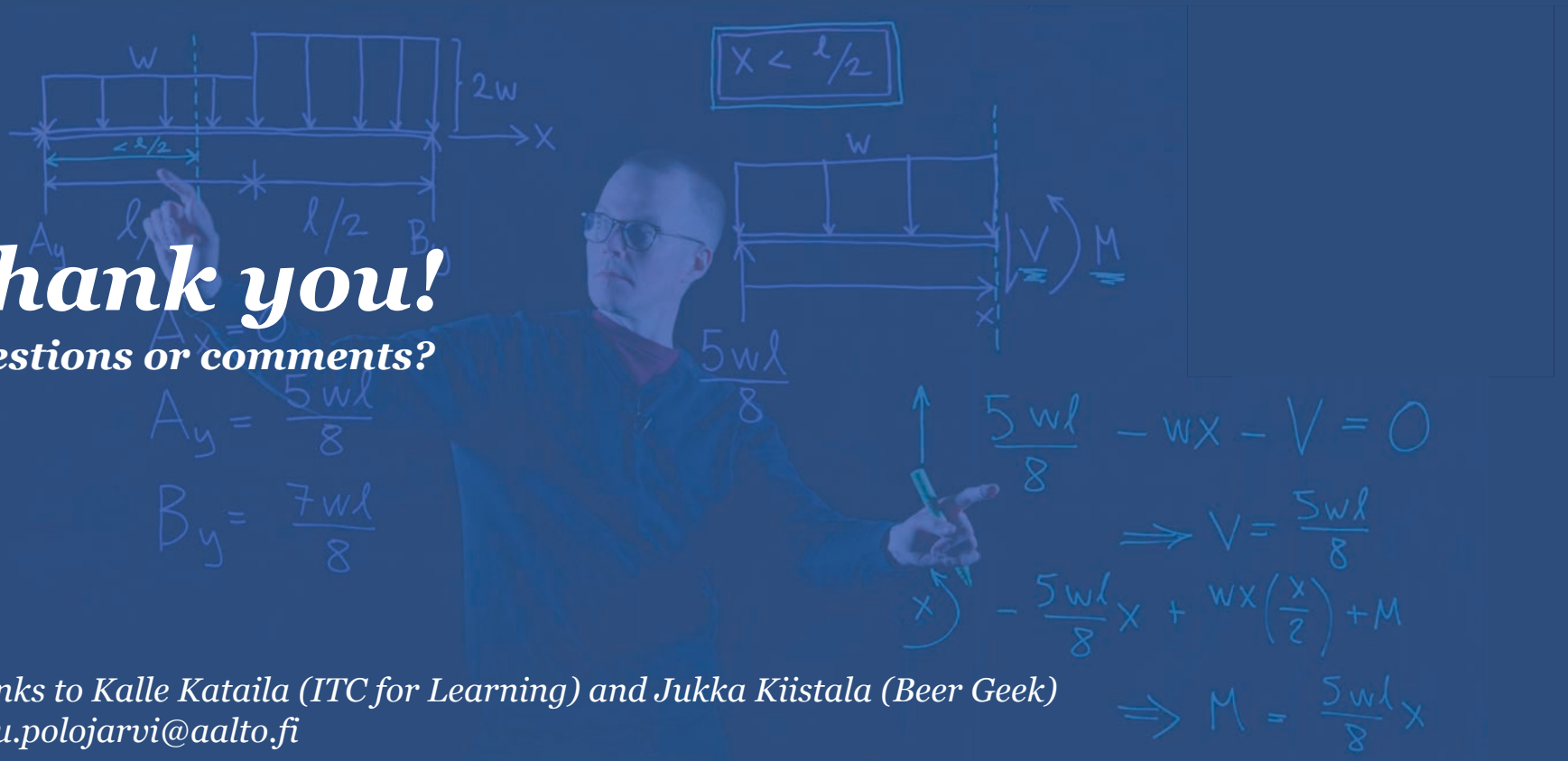

Thank you!

Questions or comments?

Thanks to Kalle Kataila (ITC for Learning) and Jukka Kiistala (Beer Geek)

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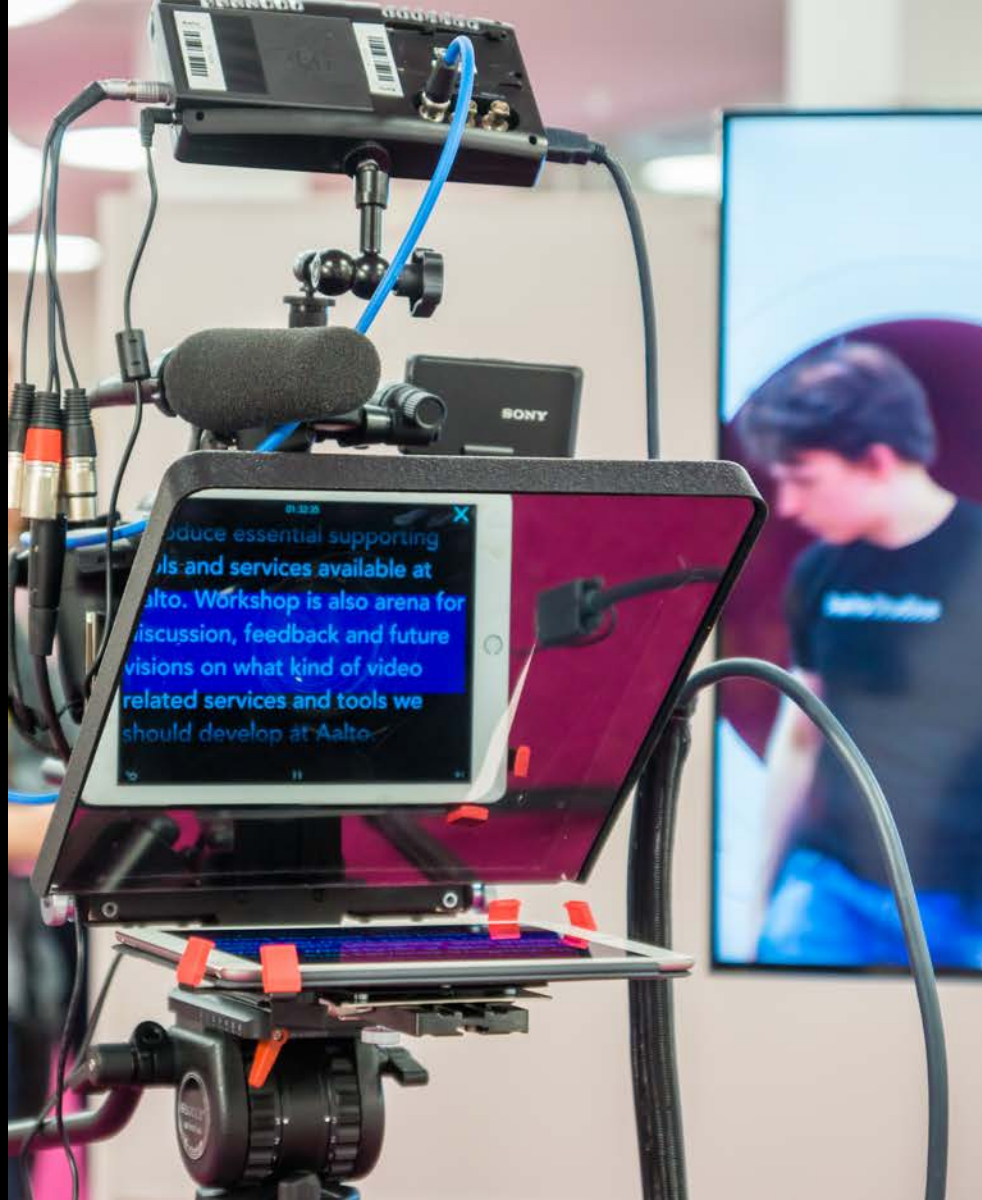
Audio Visual Centre

(including lightboard studio)

From Dec 2018 at

Learning Centre K-floor



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Lightboard bookings:

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AV-asiantuntija | Takeout
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