Pedagogik på trekvarten

flipped classrooms and peer instructions: a hands-on seminar!

Damiano Varagnolo

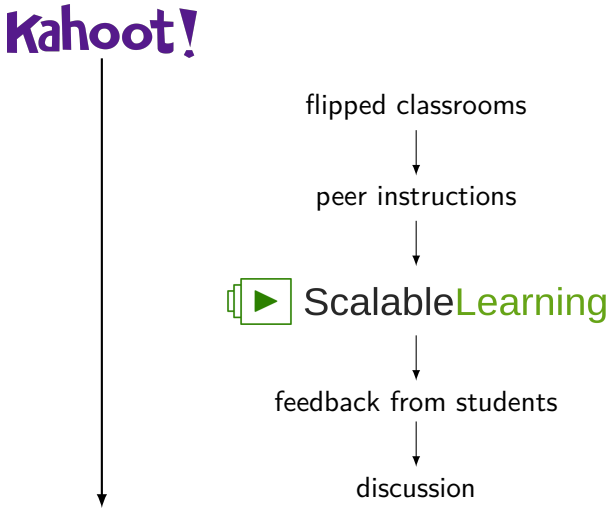
who am I?

- reglerteknik @ SRT
- principal teacher of R7003E and R7011E
- principal investigator of CITE

Roadmap

Kahoot!

Roadmap


Kahoot!
flipped classrooms
peer instructions
ScalableLearning
feedback from students
discussion

message of this talk: these strategies foster a more active learning


Kahoot!

Considerations on Kahoot

suitable for:

- gamification
- peer instructions *(in "survey" mode)*

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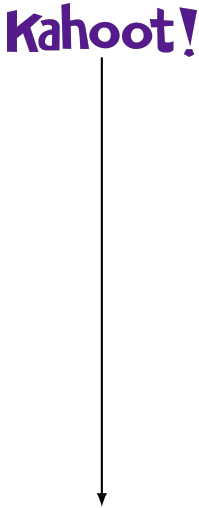
estimated times to:

- create a quiz: 1-2 minutes
- *insert* one question: 0.5-2 minutes
- launch the game: 1-2 minutes

Roadmap



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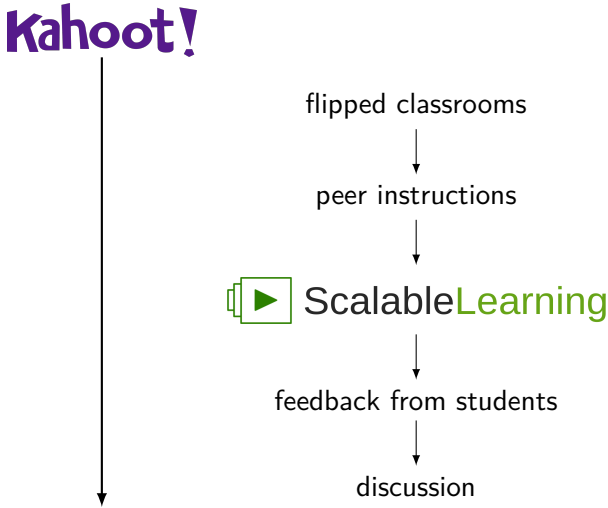
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Traditional vs. flipped classrooms

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in class		
at home		

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Traditional vs. flipped classrooms

	traditional	*flipped*
in class	deliver lectures	exercises, quizzes & discussions
at home	fixing notes & exercises	as before *plus* watch online lectures

One advantage of flipped classrooms with respect to traditional ones:

more efficient* time usage

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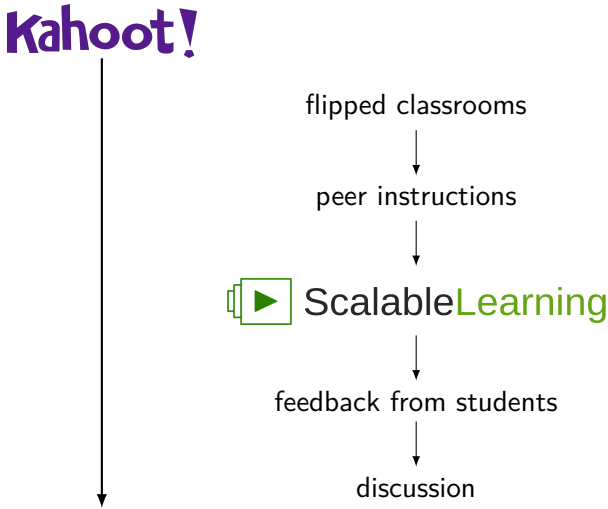
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aim = foster:

- discussions among and with students
- sharpen focus and understanding

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1. the teacher poses one question
2. students think individually and then provide an individual answer
3. the teacher shows the aggregate responses, without giving the correct answer

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4. students form small groups,

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2. students think individually and then provide an individual answer
3. the teacher shows the aggregate responses, without giving the correct answer
4. students form small groups, discuss the question,

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5. the teacher shows the new aggregate responses, then gives the correct answer, then takes and responds to questions

example[1]

[1] From Peter Newbury, UC San Diego

How should we design peer instruction questions?

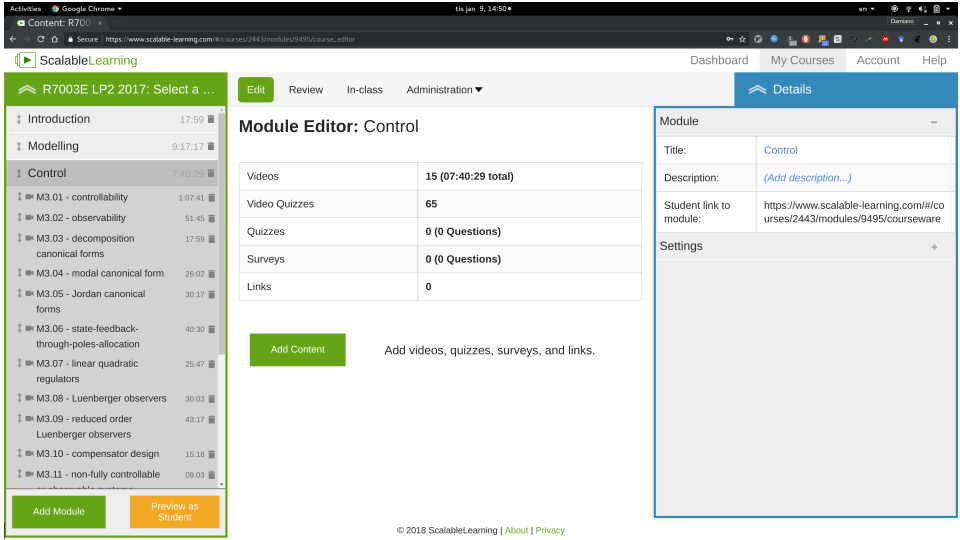
the question should[2]:

- assess concepts, not mnemonics
- have a clear teaching purpose
- be immediately clear
- fit in the context
- comprise "deceiving" wrong answers
- have a *lagom* difficulty
- stimulate discussion

[2] Adapted from Stephanie Chasteen, UC Boulder

(https://www.scalable-learning.com/)

Examples


Activities
Google Chrome
tis jan 9, 14:50
Content: R700
Secure | https://www.scalable-learning.com/#/courses/2443/modules/9495/course_editor
ScalableLearning
Dashboard
My Courses
Account
Help
R7003E LP2 2017: Select a …
Introduction 17:59
Modelling 9:17:17
Control 7:40:29
M3.01 - controllability 1:07:41
M3.02 - observability 51:45
M3.03 - decomposition canonical forms 17:59
M3.04 - modal canonical form 26:02
M3.05 - Jordan canonical forms 30:17
M3.06 - state-feedback-through-poles-allocation 40:30
M3.07 - linear quadratic regulators 25:47
M3.08 - Luenberger observers 30:03
M3.09 - reduced order Luenberger observers 43:17
M3.10 - compensator design 15:18
M3.11 - non-fully controllable 09:03
Add Module
Preview as Student
Edit
Review
In-class
Administration
Module Editor: Control
Videos 15 (07:40:29 total)
Video Quizzes 65
Quizzes 0 (0 Questions)
Surveys 0 (0 Questions)
Links 0
Add Content
Add videos, quizzes, surveys, and links.
Details
Module
Title: Control
Description: (Add description...)
Student link to module: https://www.scalable-learning.com/#/courses/2443/modules/9495/courseware
Settings
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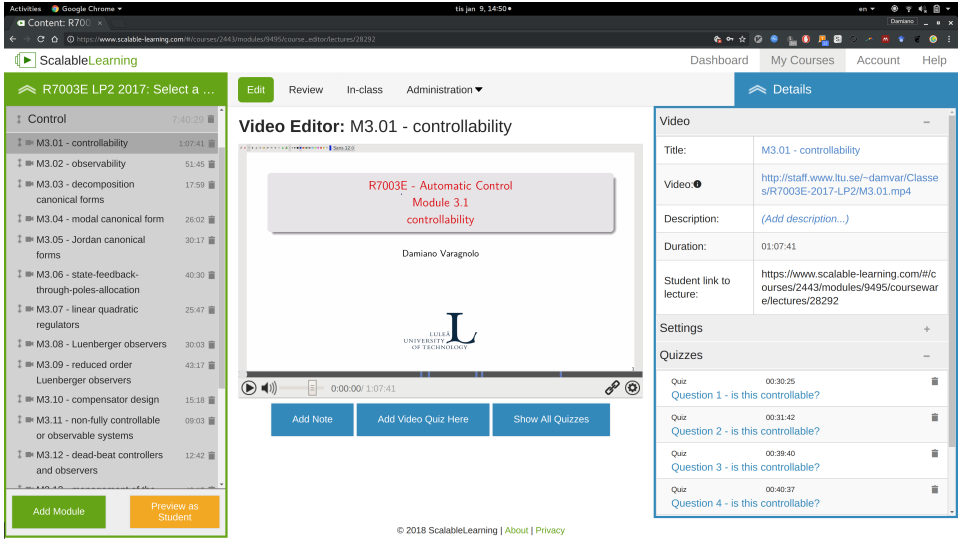
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M3.11 - non-fully controllable or observable systems 09:03
M3.12 - dead-beat controllers and observers 12:42
Add Module
Preview as Student
Edit
Review
In-class
Administration
Video Editor: M3.01 - controllability
R7003E - Automatic Control
Module 3.1
controllability
Damiano Varagnolo
LULEÅ UNIVERSITY OF TECHNOLOGY
0:00:00/ 1:07:41
Add Note
Add Video Quiz Here
Show All Quizzes
Details
Video
Title: M3.01 - controllability
Video: http://staff.www.ltu.se/~damvar/Classes/R7003E-2017-LP2/M3.01.mp4
Description: (Add description...)
Duration: 01:07:41
Student link to lecture: https://www.scalable-learning.com/#/courses/2443/modules/9495/coursewares/lectures/28292
Settings
Quizzes
Quiz 00:30:25 Question 1 - is this controllable?
Quiz 00:31:42 Question 2 - is this controllable?
Quiz 00:39:40 Question 3 - is this controllable?
Quiz 00:40:37 Question 4 - is this controllable?
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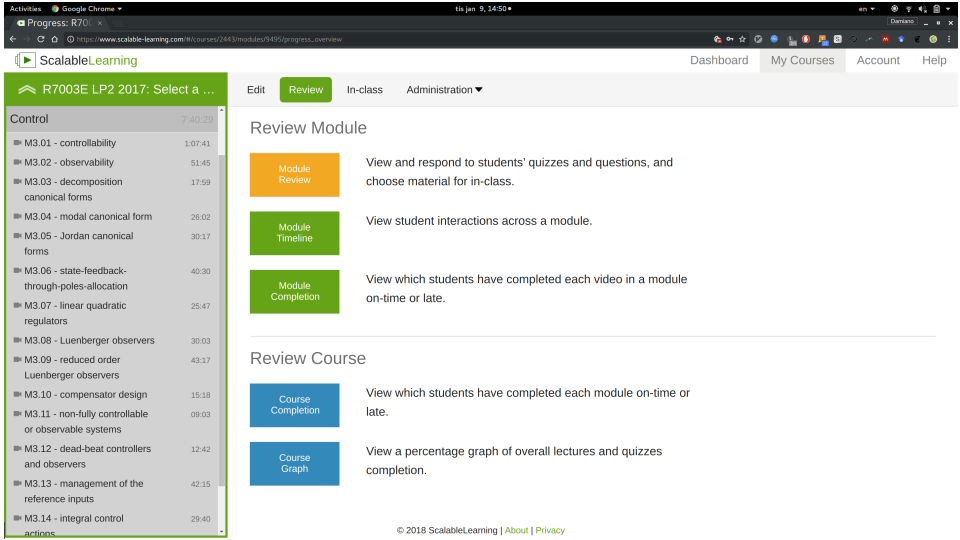
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tis jan 9, 14:50
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M3.13 - management of the reference inputs 42:15
M3.14 - integral control actions 29:40
Review Module
Module Review
View and respond to students' quizzes and questions, and choose material for in-class.
Module Timeline
View student interactions across a module.
Module Completion
View which students have completed each video in a module on-time or late.
Review Course
Course Completion
View which students have completed each module on-time or late.
Course Graph
View a percentage graph of overall lectures and quizzes completion.
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Considerations on `scalable-learning`

allows:

- adding clarification notes in post-production
- quizzes on the screen + collection and processing of statistics
- students to ask questions + conversate among themselves

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overheads to transform "traditional" slides into scalable-learning modules:

- split the slides in modules *(overhead* $= \times 0.25$*)*
- create suitable "on-slides" exercises *(overhead* $= \times 0.5$*)*
- produce the videos *(overhead* $= \times 0.5$*)*
- upload the material in the portal *(overhead* $= \times 0.10$*)*

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- The outcome of the course is a little bit blurry until all the units are done.
- Hand out more exercises!
- I would see if I could find something else than kahoot, so the students can try and solve the questions when they are at home also and don't need to compete against each other.

message of this talk: these strategies foster a more active learning

Potential discussion points

("we" = set of teachers at LTU)

1. should we push students to be active?
2. are we "running after" students to spoon-feed them?
3. are we too soft with students?
4. are we behaving as a team or as individual players?
5. should LTU promote or even enforce collaborations among us?

damiano.varagnolo@ltu.se