

Chapter 1:

Introduction to digital education

Drill & Practice

Online education platforms

Learning Management System

Classroom participation systems

Simulations

Microworlds

Teamwork support

Augmented reality

Virtual reality

Serious Games

Education Robotics

The collage features three overlapping educational interfaces. At the top is the Duolingo website, showing a French lesson with the question "Choisis la traduction de 'homme'" and a progress bar. Below it is the HappyNumbers website, displaying a math problem $72 + 16 = \square$ with base-ten blocks for tens and ones. At the bottom is a driving simulation interface with a road scene, a rearview mirror, and a question panel. The question panel includes a "Question 01" display, a "Réponse" section with options A, B, C, and D, and a "Validation" button. The questions are in French: "Je circule sur une route prioritaire :" and "Je dois obligatoirement mettre le clignotant à droite :".

duolingo Accueil Mots Activité Discussion dillenbo 0 0

Choisis la traduction de "homme"

Quitter

HappyNumbers.com English

$72 + 16 = \square$

Tens Ones

Continuer

Question 01

Réponse

A B C D

Validation

Je circule sur une route prioritaire :
OUI
NON

Je dois obligatoirement mettre le clignotant à droite :
OUI
NON

BUSUU
in 100+ languages

Get started



COURSES CREATED BY EXPERTS

Learn at your own pace

Take advantage of our bite-sized lessons as you can study at a time that's best for you. You'll try new exercises at the right level for you and can achieve certificates when you pass each level.

Learn with real people

Practice with friendly, professional tutors in live 1-to-1 lessons or group classes to build confidence in your chosen language. Don't just learn a language, speak it.

[Try Live Lessons now](#)



120 millions users

duolingo

SITE LANGUAGE: ENGLISH



The free, fun, and effective way to learn a language!

[GET STARTED](#)

[I ALREADY HAVE AN ACCOUNT](#)

70 millions users

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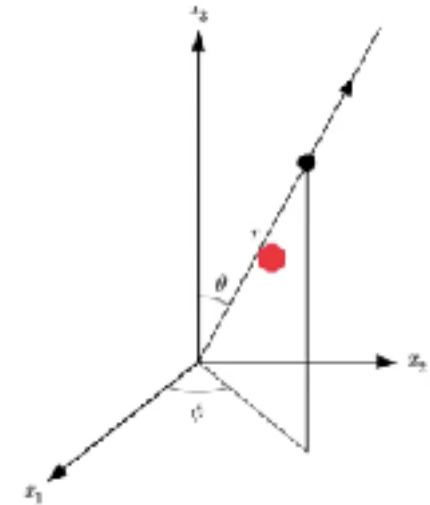
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Définition : lignes de coordonnées (c. sphériques)



Mechanique I 2019 18

EdX
Coursera

<https://www.epfl.ch/education/continuing-education/moocscatalogue/>

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Mathrix

The background of the slide is dark with colorful circuit traces in green, red, and blue in the corners. The main text is in a handwritten style.

Matériaux avec des électrons libres

EPFL

Professor Anna Fontcuberta i Morral (EPFL)

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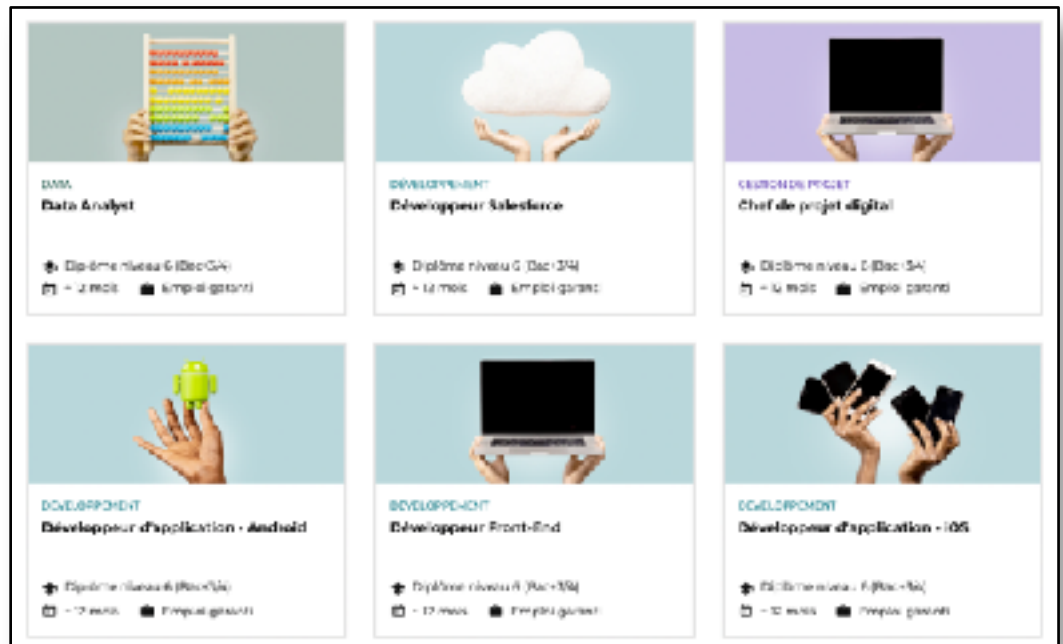
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CoopAcademy

OpenClassroom



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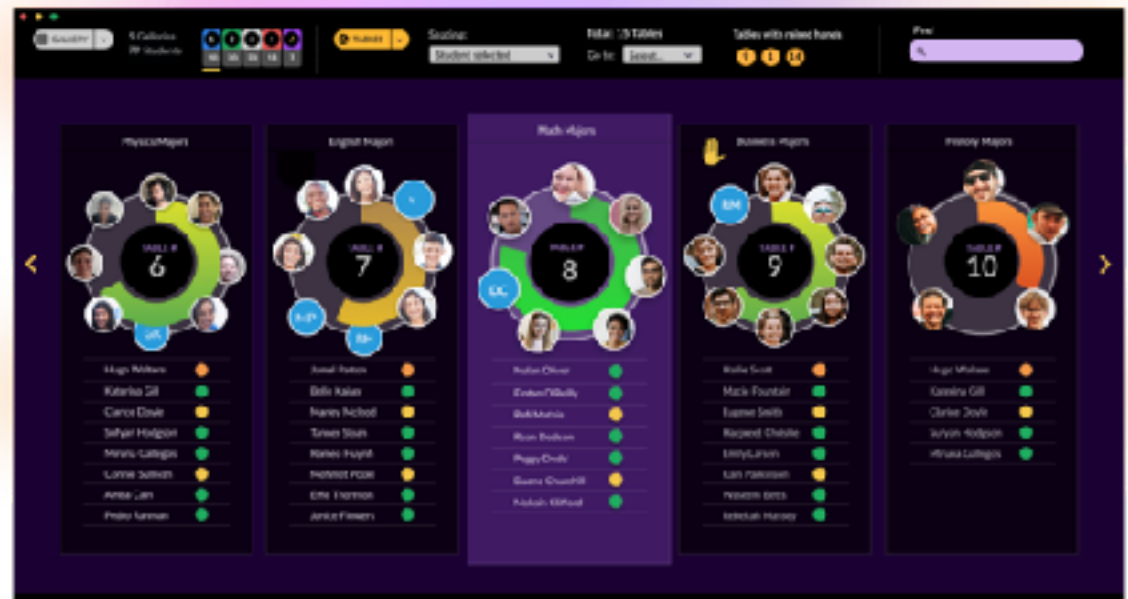
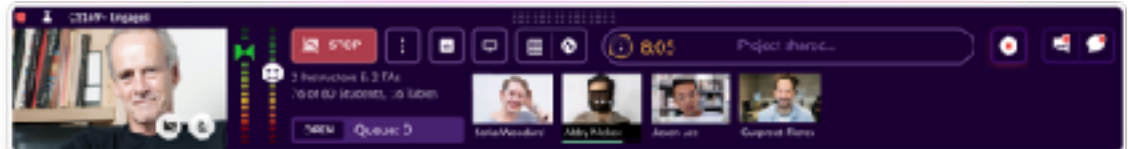
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Transformée de Laplace de $\cos t$ et polynômes

$$\mathcal{L}\{f'(t)\} = p\mathcal{L}\{f(t)\} - f(0)$$
$$\mathcal{L}\{\sin(at)\} = \frac{a}{p^2 + a^2}$$
$$\mathcal{L}\{\cos(at)\} = p\mathcal{L}\left\{\frac{1}{a}\sin(at)\right\} - \frac{1}{a}\sin 0$$
$$= \frac{p}{a}\mathcal{L}\{\sin(at)\} =$$

$f'(t) = \cos(at)$
 $f(t) = \frac{1}{a}\sin(at)$

2:30 / 8:57

Khan Academy

Comparer des fractions qui n'ont ni le même numérateur ni le même dénom...

Compare les fractions suivantes en utilisant les symboles $>$, $<$, ou $=$.

$\frac{5}{3}$ $> \frac{10}{8}$

Bravo ! Pour aller plus loin.

Signaler un problème

Excellent travail!

Continuez. [Voyez comment nous avons répondu.](#)

Réussissez 5 questions sur 7 pour passer à Familier

Question suivante...

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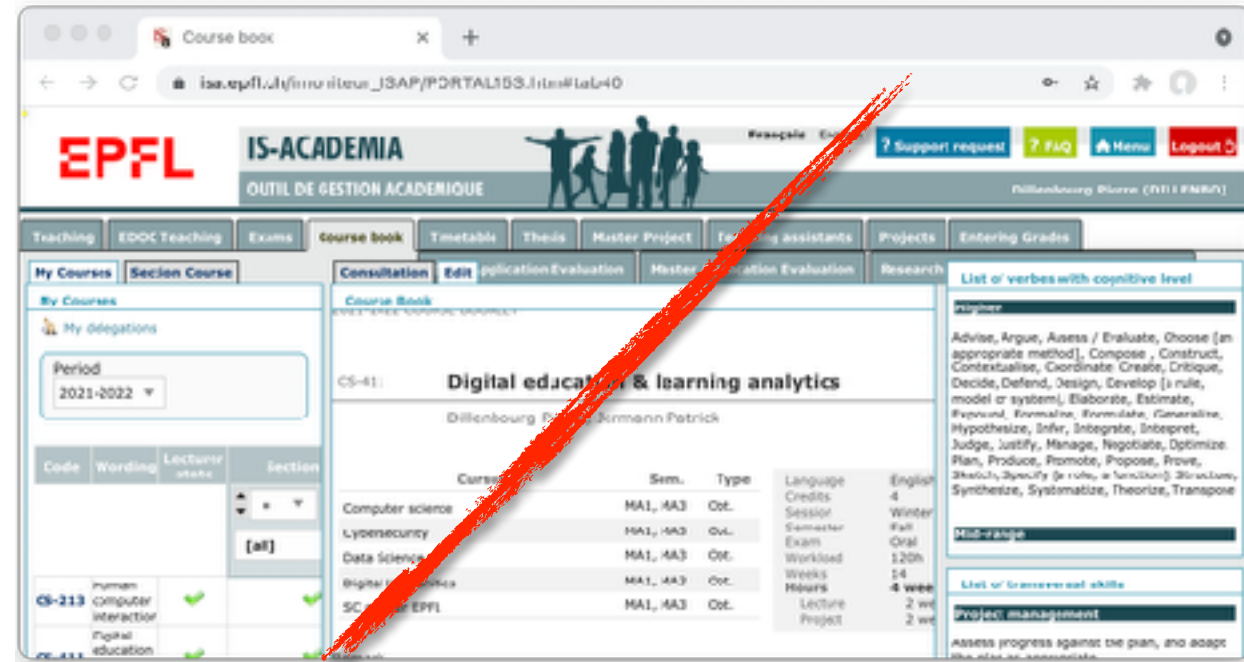
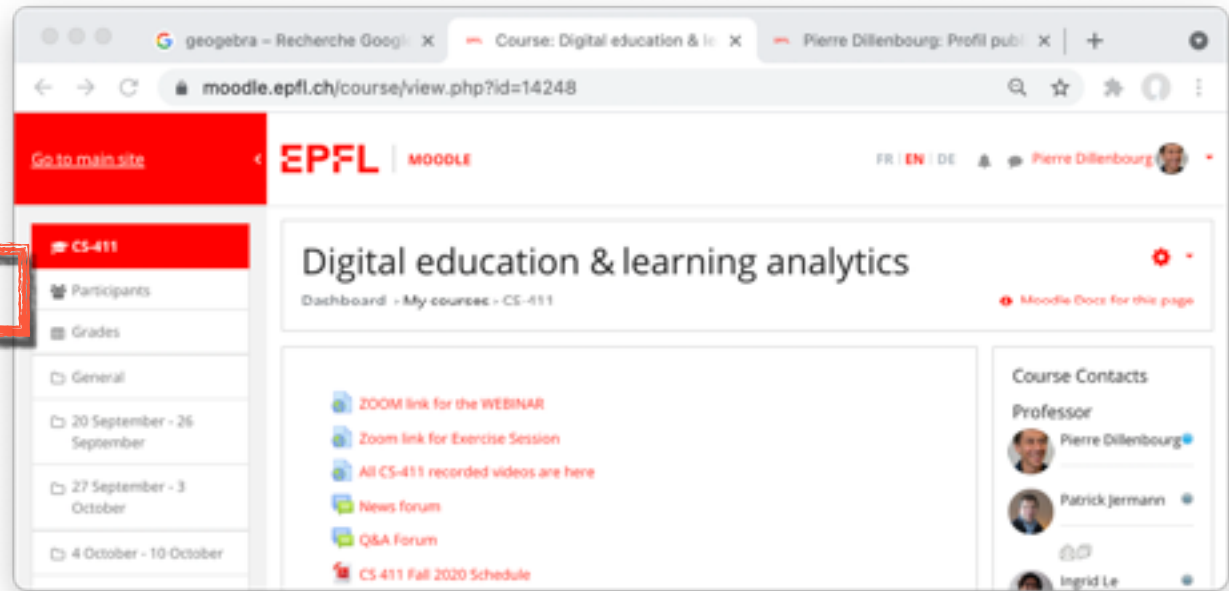
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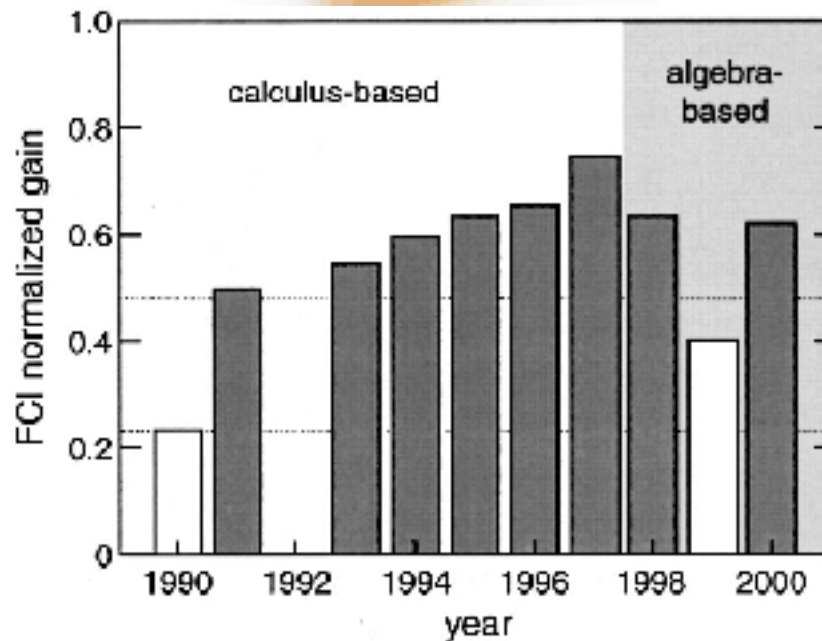
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Force Concept Inventory Score



Crouch, C.H., & Mazur, E. (2001). Peer Instruction: Ten years of experience and results. *American Journal of Physics*, 69, 970-977.

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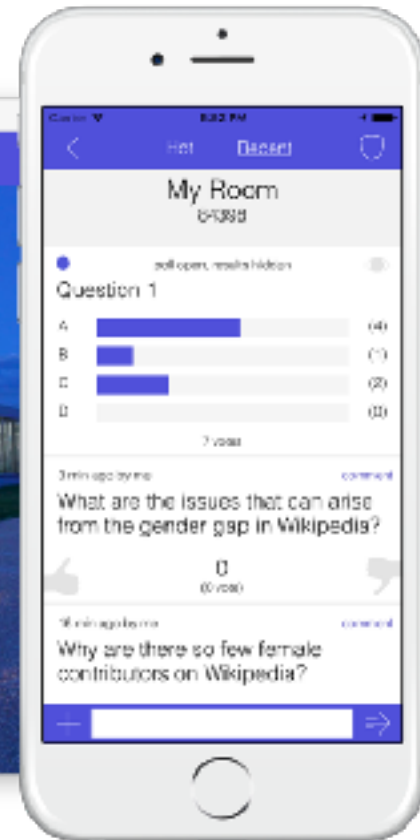
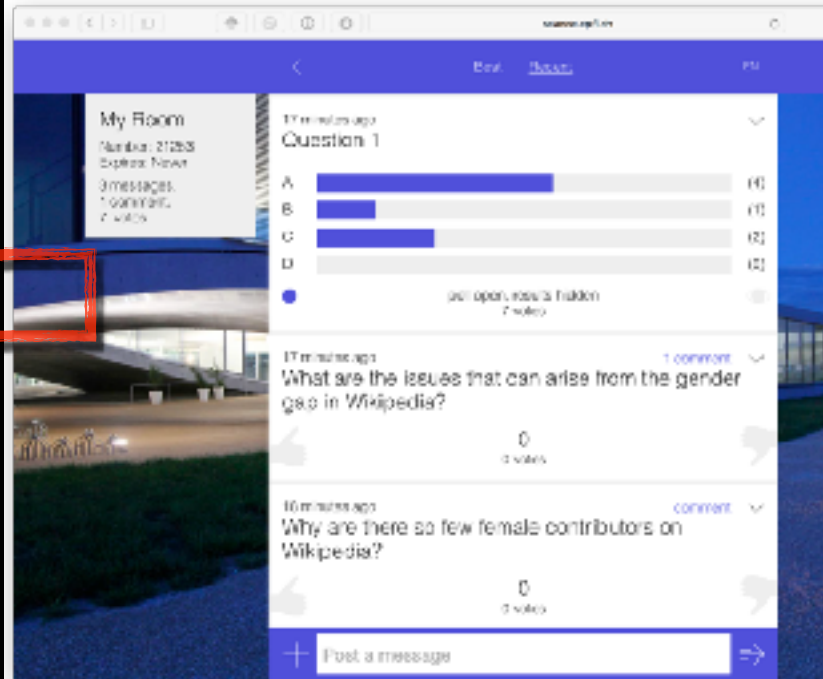
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Speak Up

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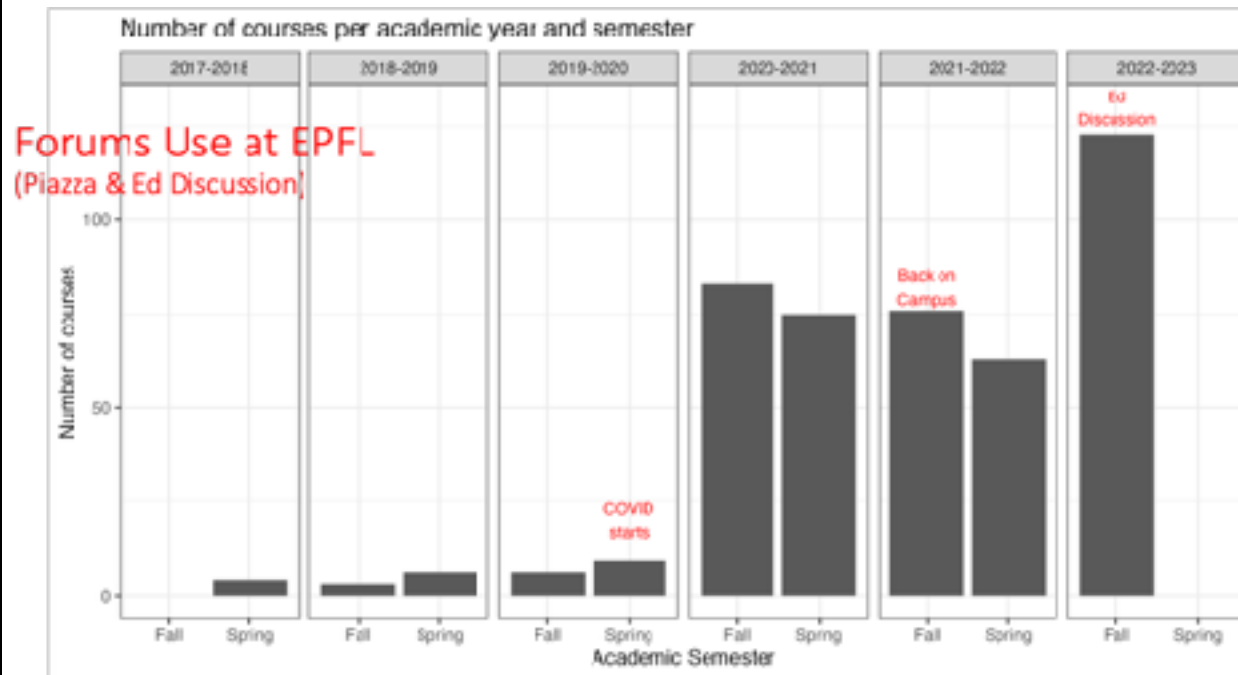
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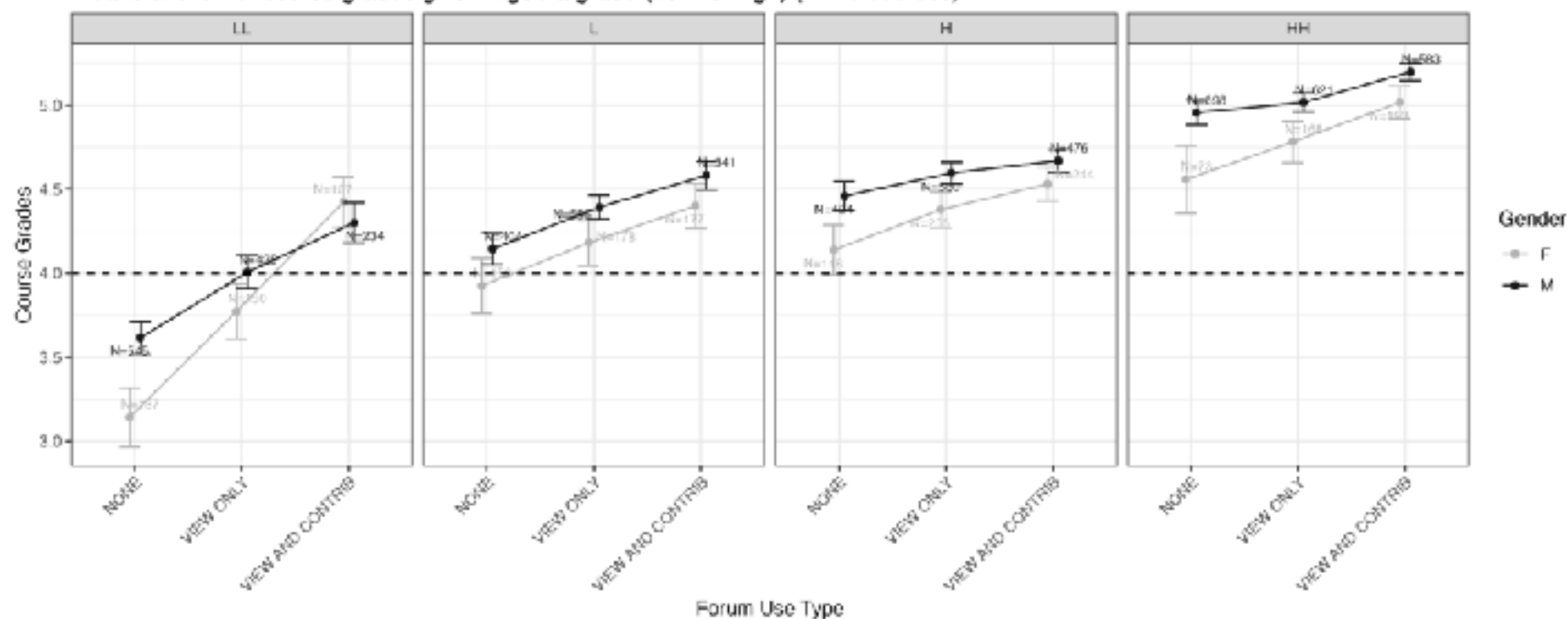
Education Robotics

The screenshot shows the 'ed Playground - Discussion' interface. On the left, a sidebar lists various course categories, with 'Quadratic equation' highlighted. The main content area displays a discussion thread titled 'Quadratic equation'. The thread includes a post by user 'Anonymous' asking for help with the equation $ax^2 + bx + c = 0$. Below the post, there is a section for '1 Answer' provided by user 'Scott MacKenzie', who includes the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ and a graph of a parabola. The interface also features a search bar, filters, and a list of recent discussions.





Means and CI for course grades given Algebra grade (Low to High) (N=19 courses)



Education is a data science

Drill & Practice

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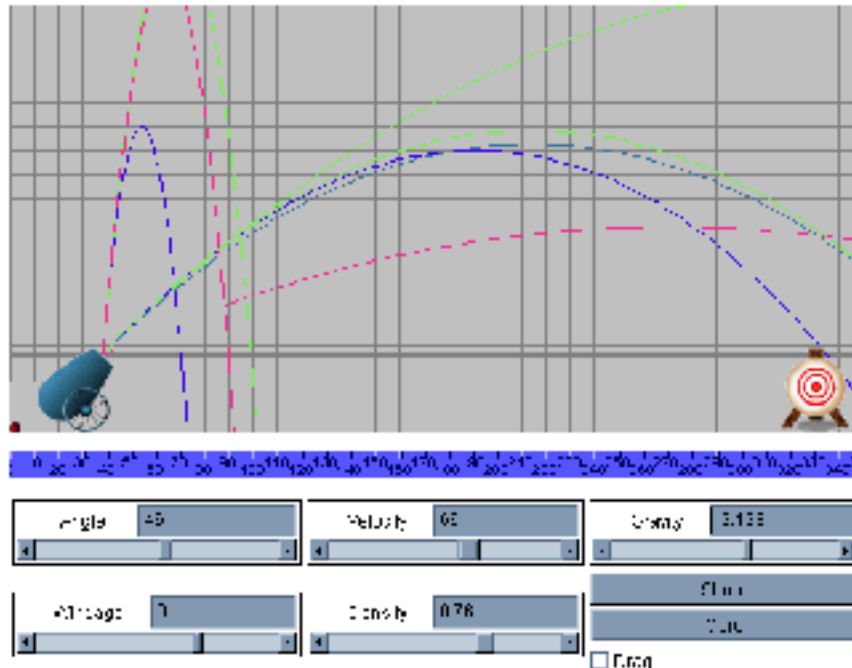
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Augmented reality

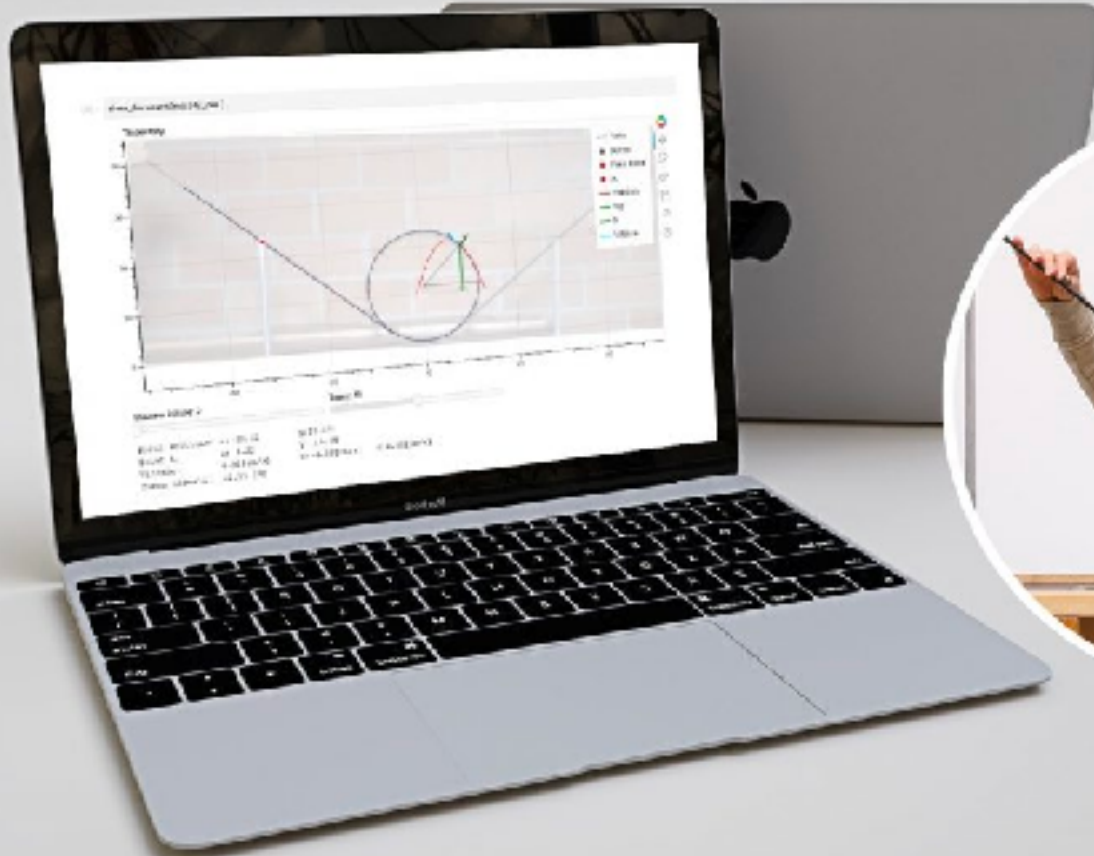
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Jupyter Notebook



Paolo Prandoni EPFL

<https://www.epfl.ch/education/educational-initiatives/jupyter-notebooks-for-education/teachers-experience-with-jupyter-notebooks/interactive-multimedia-narratives-to-foster-students-curiosity/>

Jupyter Notebook



Prof. Cecile Hebert, EPFL

<https://www.epfl.ch/education/educational-initiatives/jupyter-notebooks-for-education/>

JupyterLab

15:11:00:3333/lab/tree/src/notebooks

Software sews | dco | @jupyterlab | jupyterlab | ChatGPT | AWS Forti | AWS root | Visu Repo | Send Repo | Backend repo | Fmaneta | Jira | General Notes | Flask-EQLAlchemy

File | Edit | View | Run | Kernel | Dashboard | Tabs | Settings | Help

DASHBOARD TOC

No Notebook

Open a notebook to start viewing its content.

Launcher

src/notebooks

Notebook

Python 3 (ipykernel)

JavaScript (Node.js)

tertkernel

Console

Python 3 (ipykernel)

JavaScript (Node.js)

tertkernel

Other

Terminal

Text File

Markdown File

Python File

Show Contextual Help

Simple 0 2

Launcher

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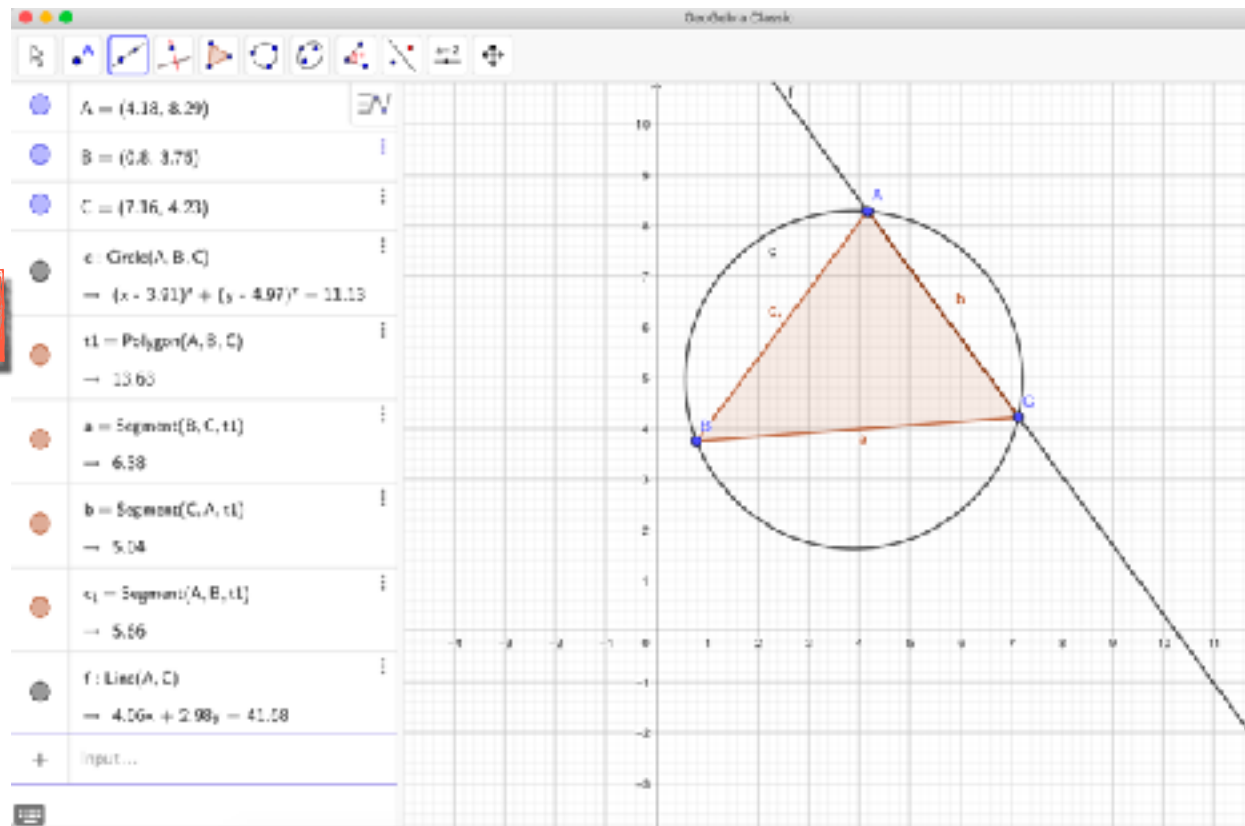
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Geogebra

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Minecraft

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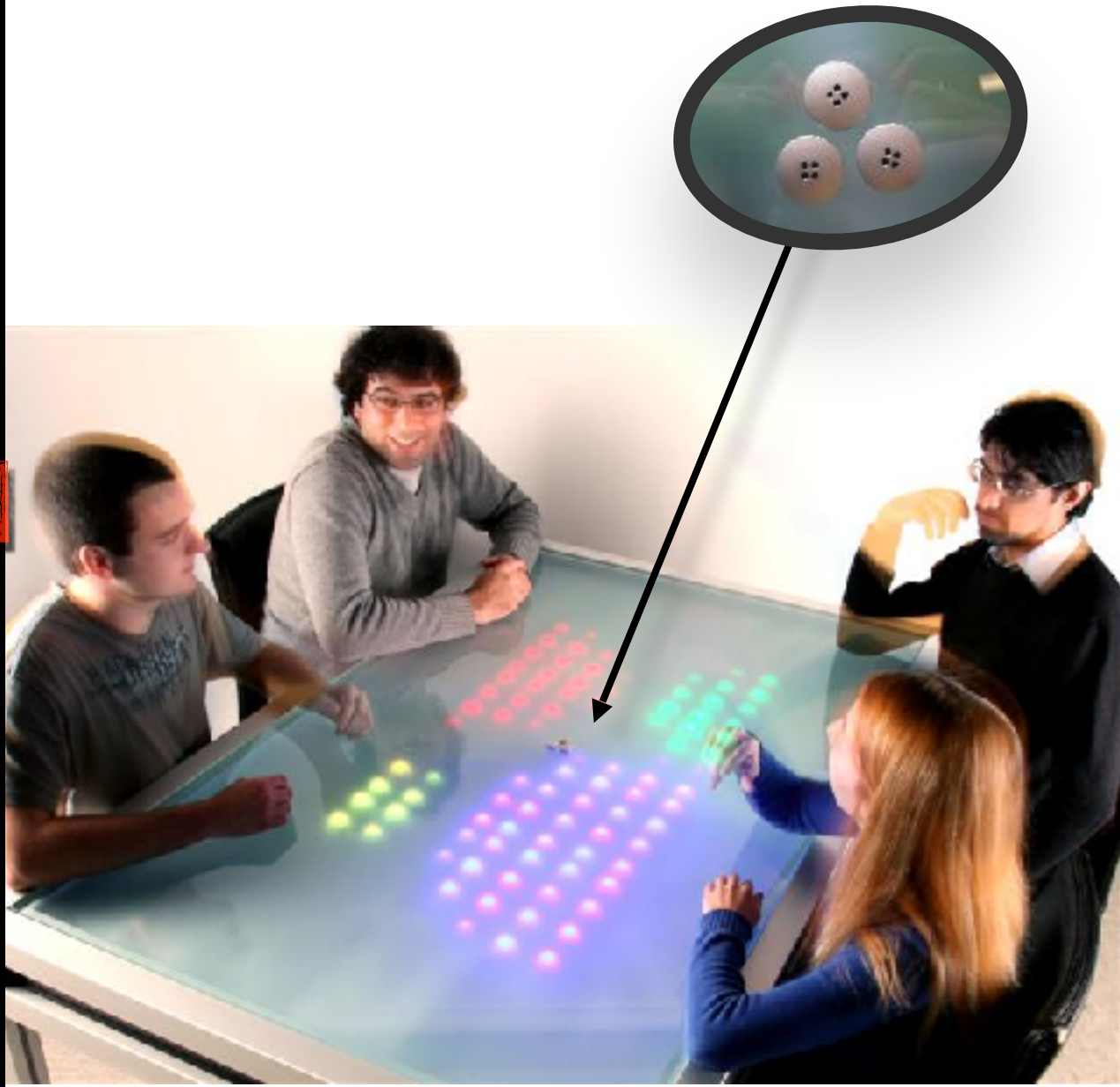
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Reflect

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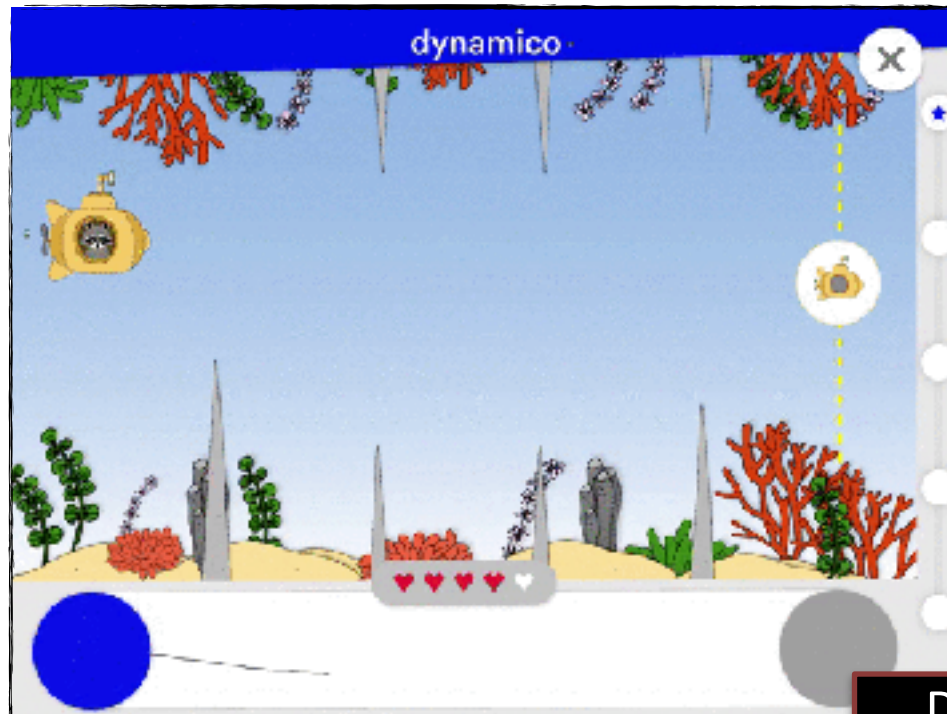
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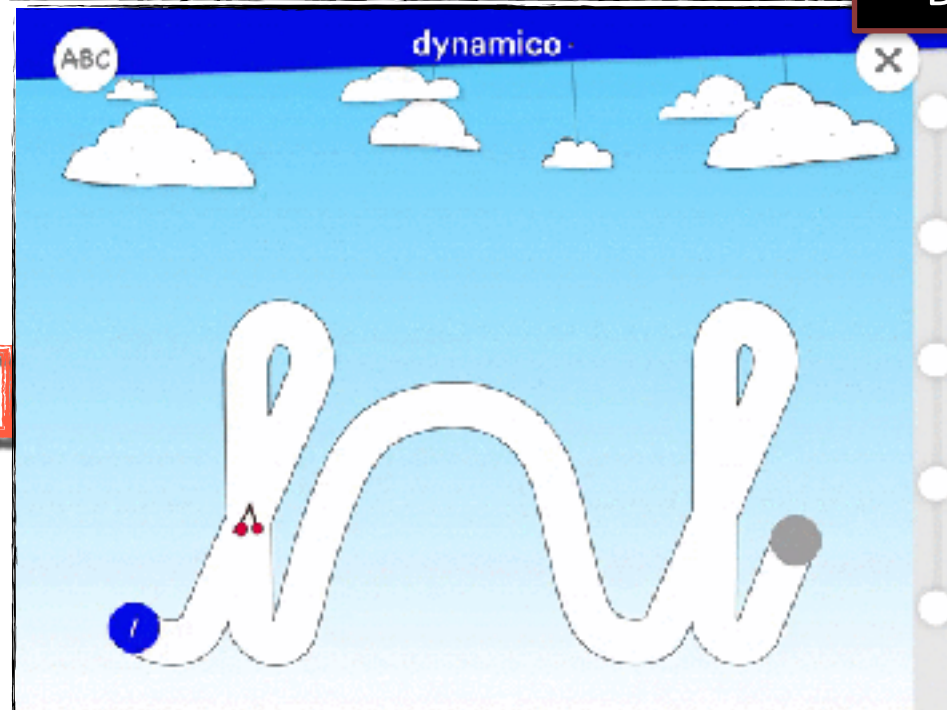
Virtual reality

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Dynamico



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thymio



Cellulo



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many technologies !

how do they support learning ?

how do we learn ?

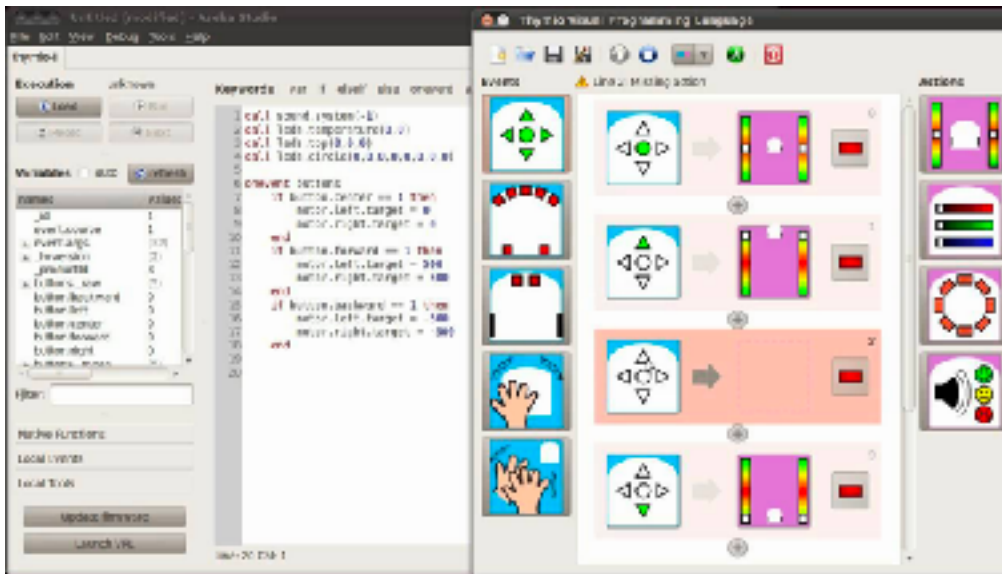
Learning **what** ?

Digital Skills

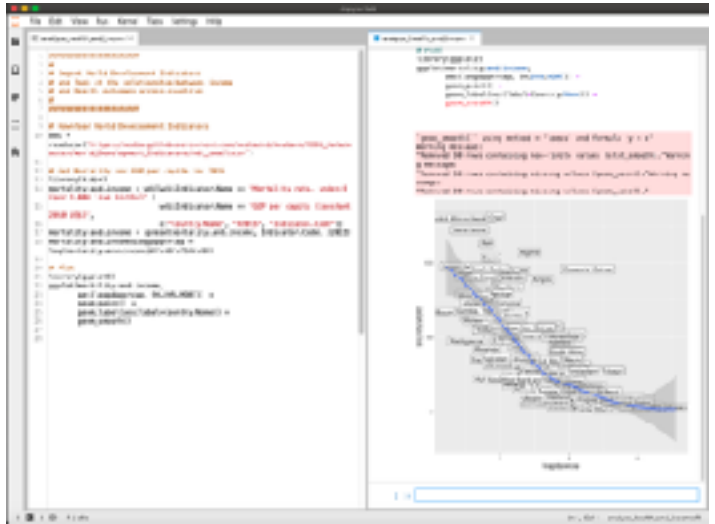
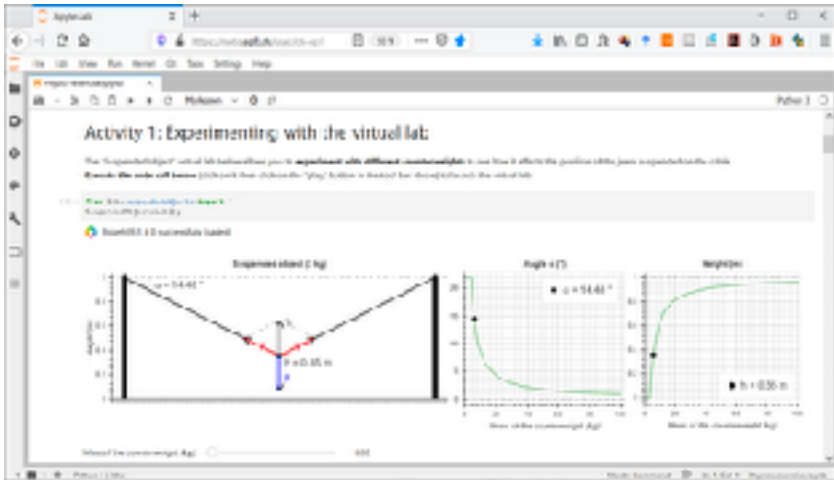


Learning **how** ?

Digital Tools



Learning what : Data Sciences



Digital Tools

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Digital Skills

Computational thinking

Coding

Data analyses

Makers spaces

Additive manufacturing

Sensors

IOT

Networks



Digital Skills

Computational thinking

Coding

Data analyses

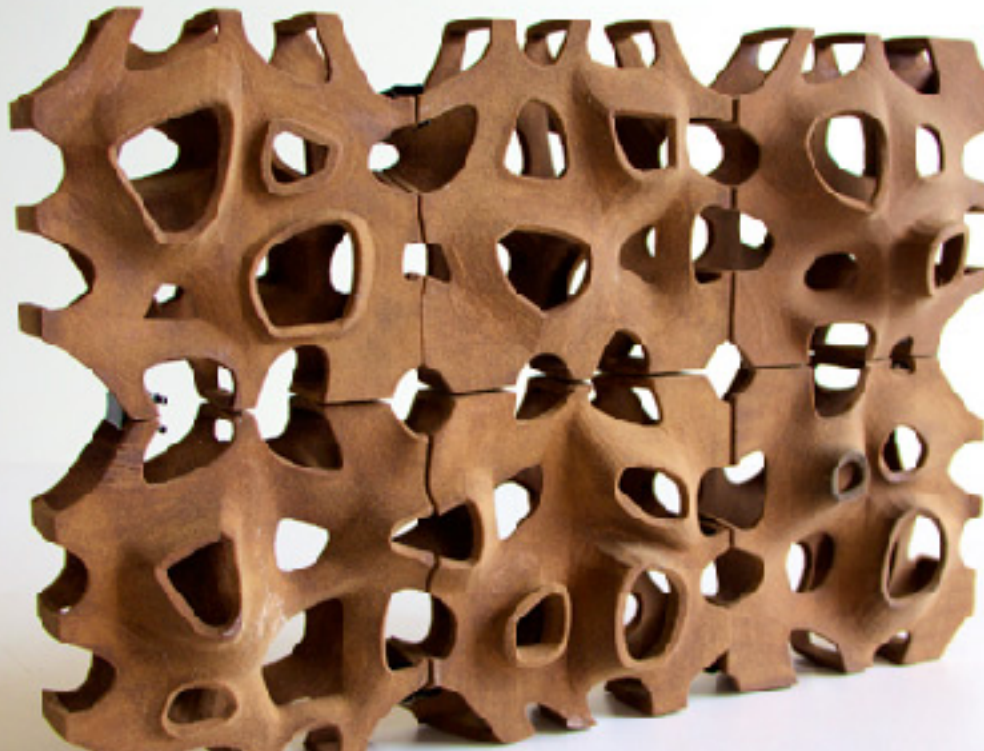
Makers spaces

Additive manufacturing

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Networks



	Course (08 :15 – 10 :00)	Assignment (10 :00-12 :00)
W1 19/09	Chapter 1: Learning technologies	Experience a PS-I approach (form groups, share all resources)
W2 26/09	Chapter 2: Memory & Learning	Tutorial on Jupyter Notebooks (decide on project idea)
W3 03/10	Chapter 3: Discovery learning	Analyze the learning tasks (identify learning goals, tasks, interventions, blah)
W4 10/10	Chapter 4: Mastery Learning	Design scenarios (Moodle)
W5 17/10	Chapter 5: Designing Experiments	Implement the scenario
W6 24/10	Chapter 6: Social Cognition	Implement the scenario
W7 31/10	Chapter 7: Maker Spaces	Implement the scenario
W8 7/11	Chapter 8: Statistical analysis	Implement the scenario
W9 14/11	Chapter 8: Statistical analysis	Implement the scenario
W10 21/11	Chapter 9: Augmented reality	Run experiments
W11 28/11	Chapter 10: Learning computational thinking skills Frédérique Chessel-Lazzarotto	Run experiments
W12 05/12	<i>Chapter 11: Generative AI in Education</i>	Analyze data
W13 12/12	<i>Chapter 12: EdTech Startups</i>	Analyze data
W14 19/12	Project presentation	Project presentation overflow

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Learning Analytics

Digital Skills

Computational thinking

Coding

Data analyses

Makers spaces

Additive manufacturing

Sensors

IOT

Networks

Learning Analytics

CS-421

Machine learning for behavioral data

Käser Tanja

Cursus	Sem.	Type
Cybersecurity	MA2, MA4	Opt.
Data Science	MA2, MA4	Opt.
Informatique	MA2, MA4	Opt.
SC master EPFL	MA2, MA4	Opt.

Language	English
Credits	4
Session	Summer
Semester	Spring
Exam	Written
Workload	120h
Weeks	14
Hours	4 weekly
Lecture	2 weekly
Project	2 weekly
Number of positions	



Professor Tanja Käser
EPFL

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Inferential

Statistics

==> Causality

Digital Skills

Computational thinking

Coding

Data analyses

Makers spaces

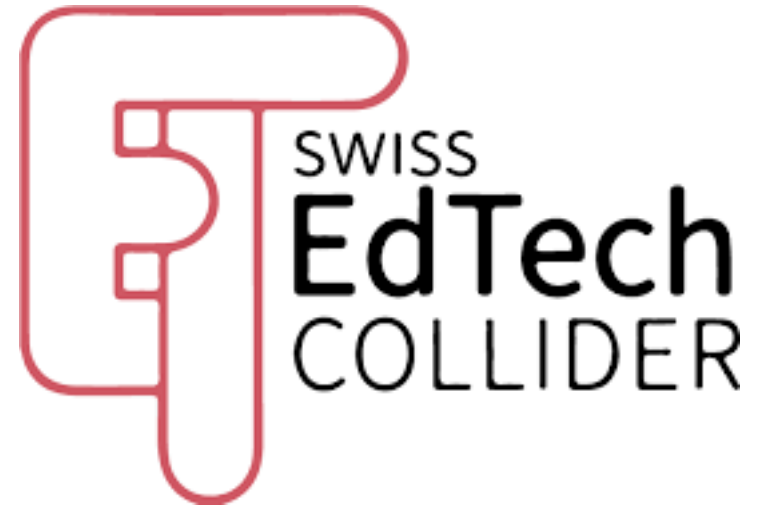
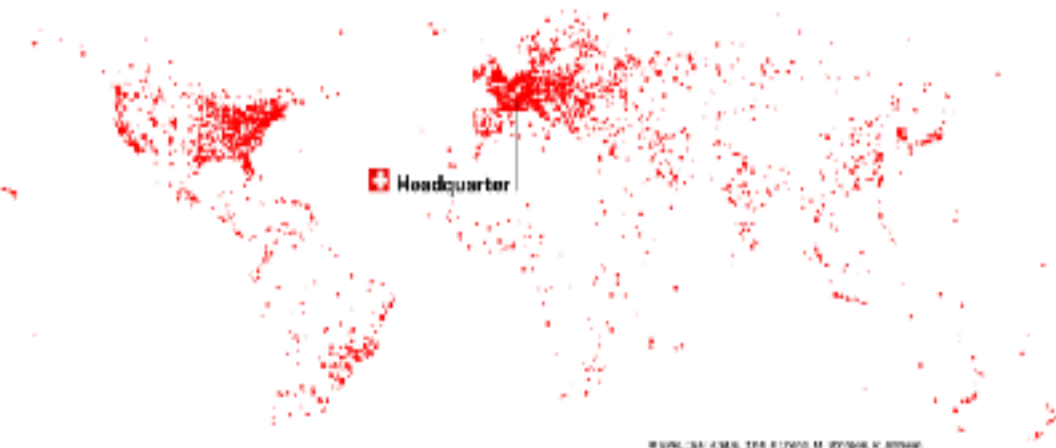
Additive manufacturing

Sensors

IOT

Networks

EPFL CAMPUS



EPFL Center for Learning Sciences





EPFL-ETHZ joint doctoral program in learning sciences

Learning Sciences is an emerging, interdisciplinary research area that focuses on developing a multi-faceted understanding of learning as it happens in the real world, as well as designing, implementing and improving learning environments.

1145

Project (50%)

Teams of 3-4

Design a PS-I and a I-PS scenario

Implement it in Jupyter

Run experiment

Statistical Analysis

Exam (50%)

Written: 2 hours

Applied questions

Last year exam on moodle