

Post-pandemic/MOOC digital strategy for education

Emerging digital strategy for education

1. To gain flexibility
2. To enrich teacher-students interactivity
 - flipped classroom
 - asynchronous interactions
 - Jupyter notebooks
3. To exploit our semantic treasure
4. To adjust to evolving study habits
5. To cope with students number growth
6. To open to greater students diversity
7. To inform management decisions with data

- Replacing 1-2 missing lectures
- Replacing 1-2 courses per annual curriculum
- ...
- Shared doctoral courses with EuroteQ partners



EPFL strategy

1. Flexibility
2. Interactions
 - Fipped
 - Asynchronous
 - Jupyter
3. Semantic
4. Study habits
5. Growth
6. Diversity
7. Data

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2. Interactions

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3. Semantic

4. Study habits

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EPFL strategy

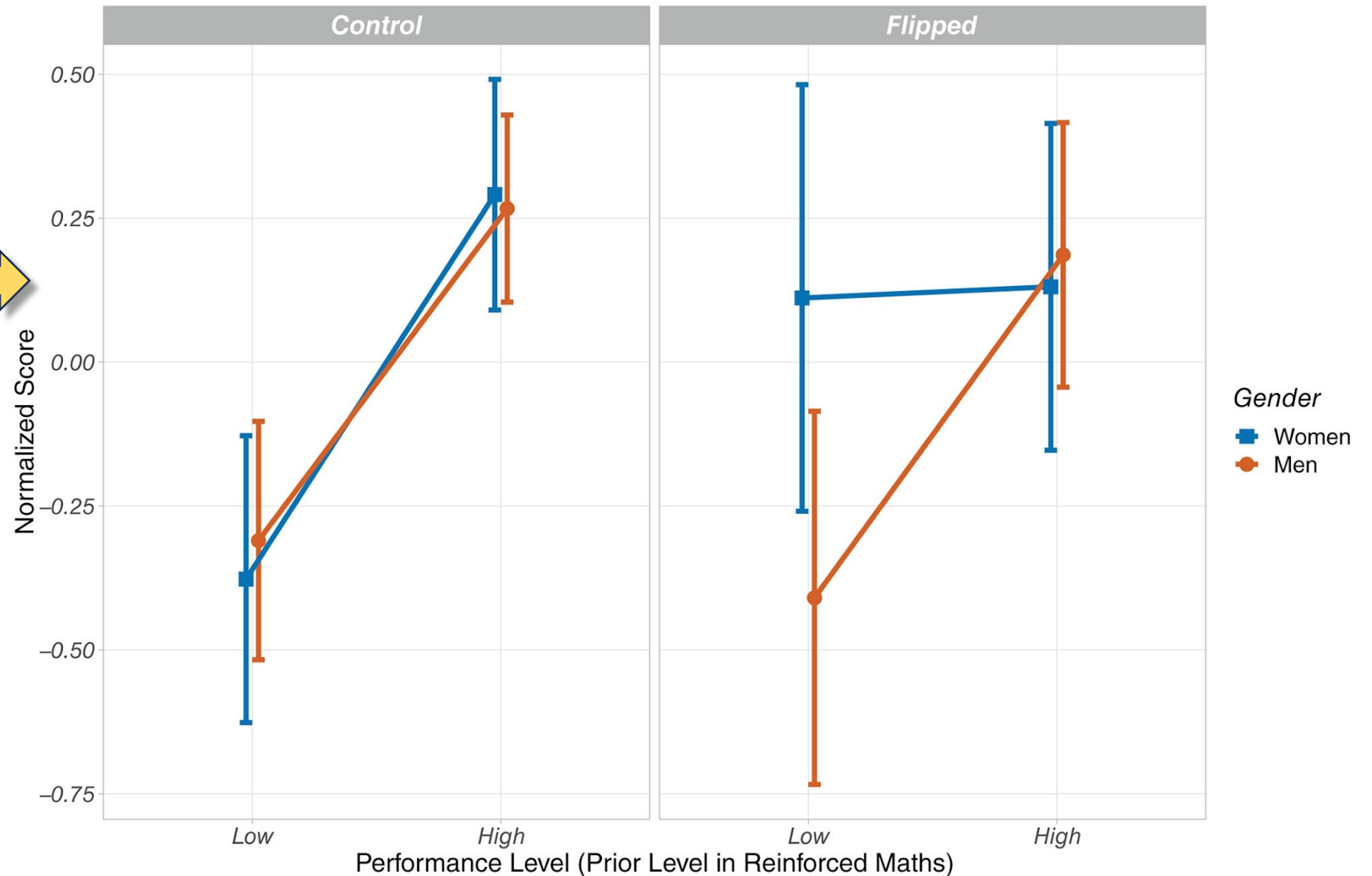
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Mean and Confidence Interval (95%)

INT and NAT Students

First year linear algebra



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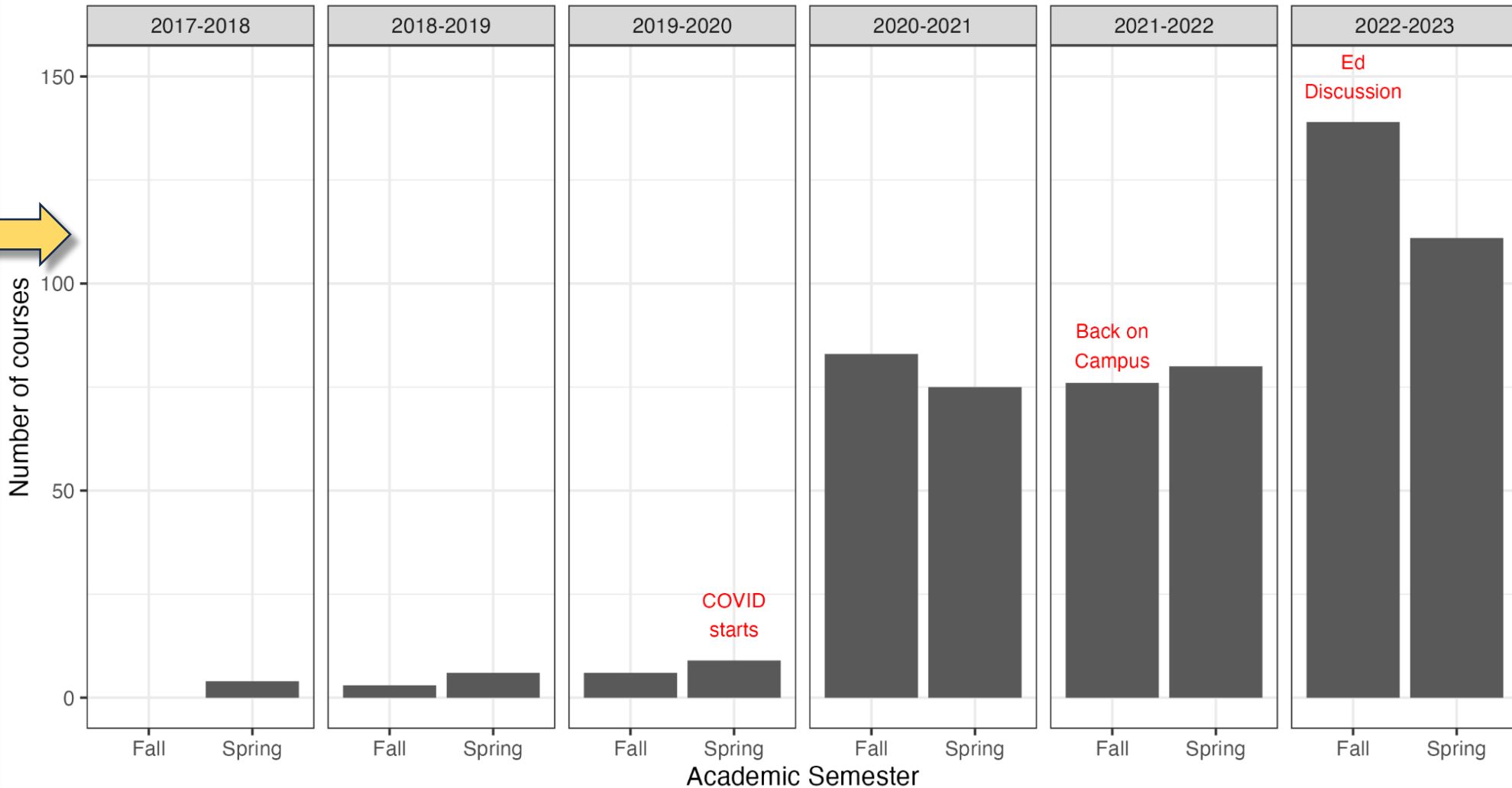
5. Growth

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Online Asynchronous Q&A

Number of courses per academic year and semester



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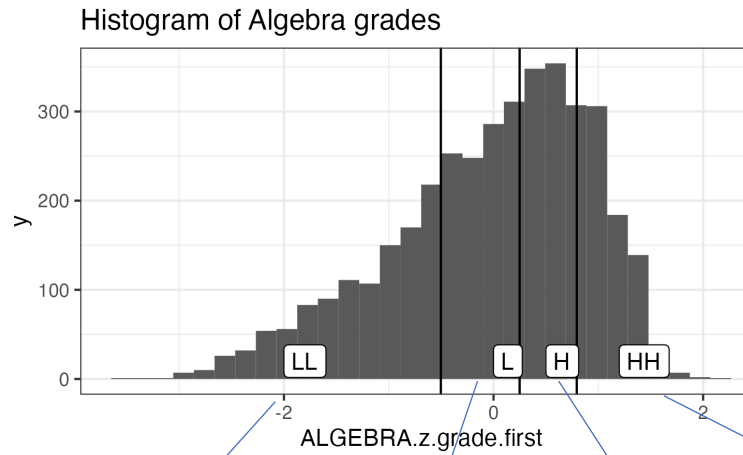
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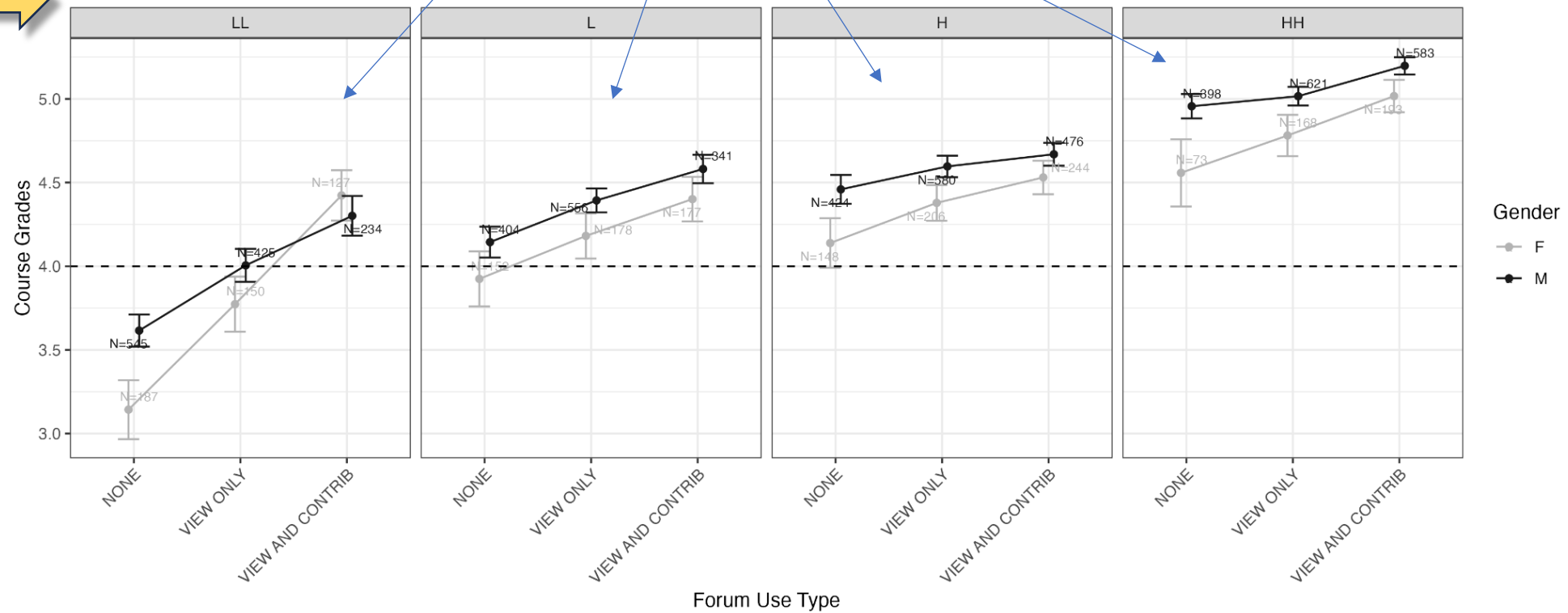
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Means and CI for course grades given Algebra grade (Low to High) (N=19 courses)



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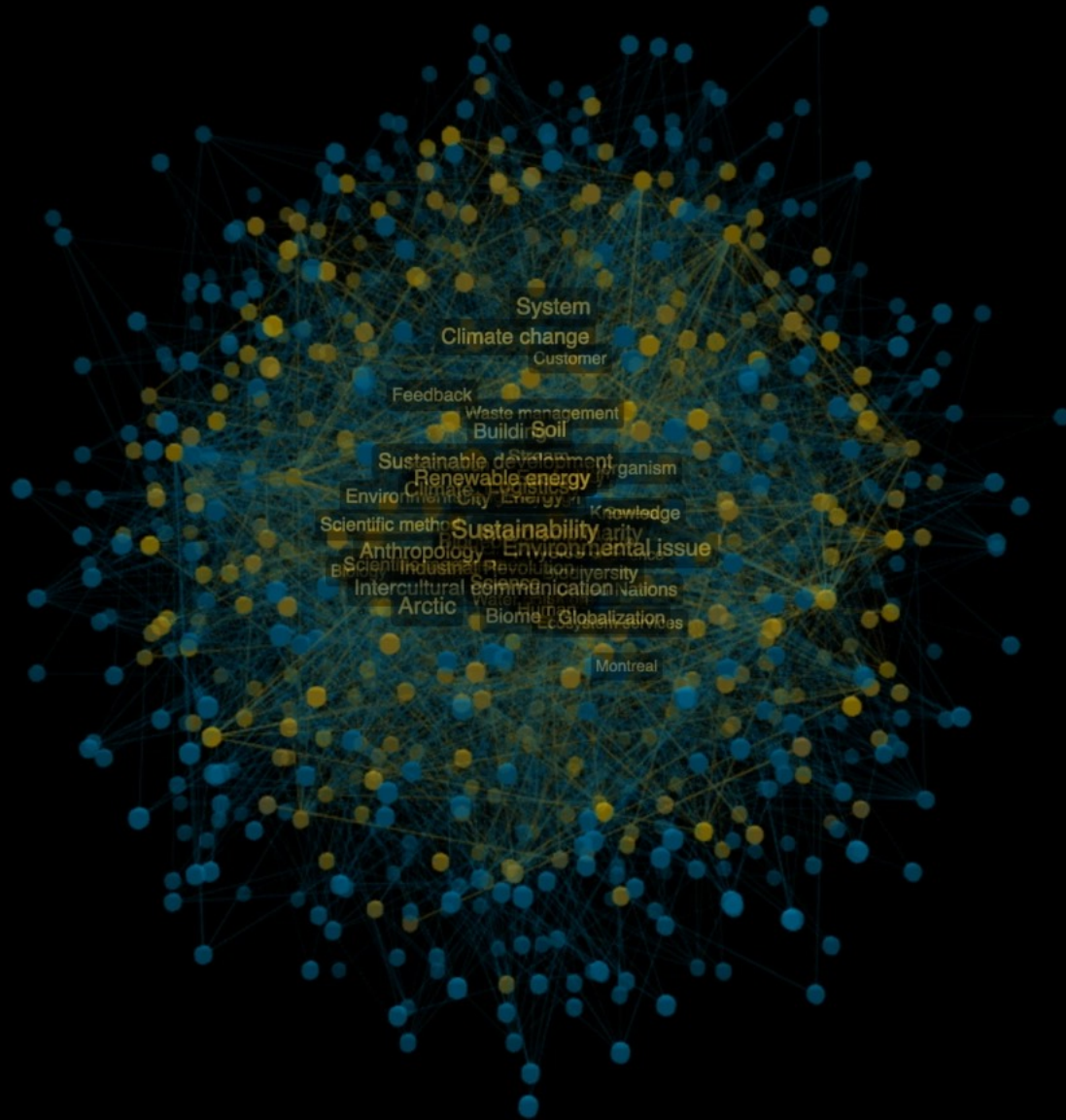
Discipline	Use case	Language	Repository	Execute on noto
General Physics: Mechanics	Demonstrations in class	Python	https://github.com/c-hebert/MecaDRIL	https://go.epfl.ch/mecadril
Numerical Modelling of Solids and Structures	Exercise worksheets	Python	https://c4science.ch/source/mnss-notebook-demo	https://go.epfl.ch/MNSS-demo
Signal Processing for Communications	Interactive textbook	Python	https://github.com/prandoni/COM303	https://go.epfl.ch/COM303-noto
Image Processing	Assignments (automatically graded)	JavaScript,Python, SoS		
Machine Learning for Engineers	Exercise worksheets Assignments (automatically graded)	Python	https://github.com/vita-epfl/introML-2021	https://go.epfl.ch/introML-noto
Quantum Mechanics and Materials Science	Demonstrations in class	Python	https://github.com/oss-car-org/quantum-mechanics	https://go.epfl.ch/quantum-mechanics-noto
Solid State Physics	Demonstrations in class	Python	https://github.com/oyazyev/SolidDRIL	https://go.epfl.ch/SolidDRIL-noto
Numerical Analysis	Exercise worksheets	Python	https://c4science.ch/source/PubNumAnalysis pynb/	https://go.epfl.ch/NumAnalysis-noto
Heat and Mass Transfer	Interactive textbook	Python	https://c4science.ch/source/Convection/	https://go.epfl.ch/Convection-noto
Machine Learning	Exercise worksheets	Python	https://github.com/epfml/ML_course	https://go.epfl.ch/ML_course-noto
Optimization for Machine Learning	Exercise worksheets	Python	https://github.com/epfml/OptML_course	https://go.epfl.ch/OptML-noto
Computational Chemistry	Interactive textbook Exercise worksheets	Python	https://lcbc-epfl.github.io/iesm-public/intro.html	https://go.epfl.ch/IESM-noto
Molecular Dynamics Monte Carlo	Exercise worksheets	Python	https://github.com/lcbc-epfl/mdmc-public	https://go.epfl.ch/MDMC-noto
	Interactive			

32



Global warming

global



https://graphsearch.epfl.ch/

EPFL Graph

Chercher

EN | FR

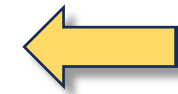
Entrez l'intitulé ou le code d'un cours pour ouvrir sa page. Vous pouvez également chercher des concepts, des personnes et des publications.

Informations Confidentialité Contact Disclaimer

Version 0.10.0 | Last updated on 03-19-2021 at 22:41

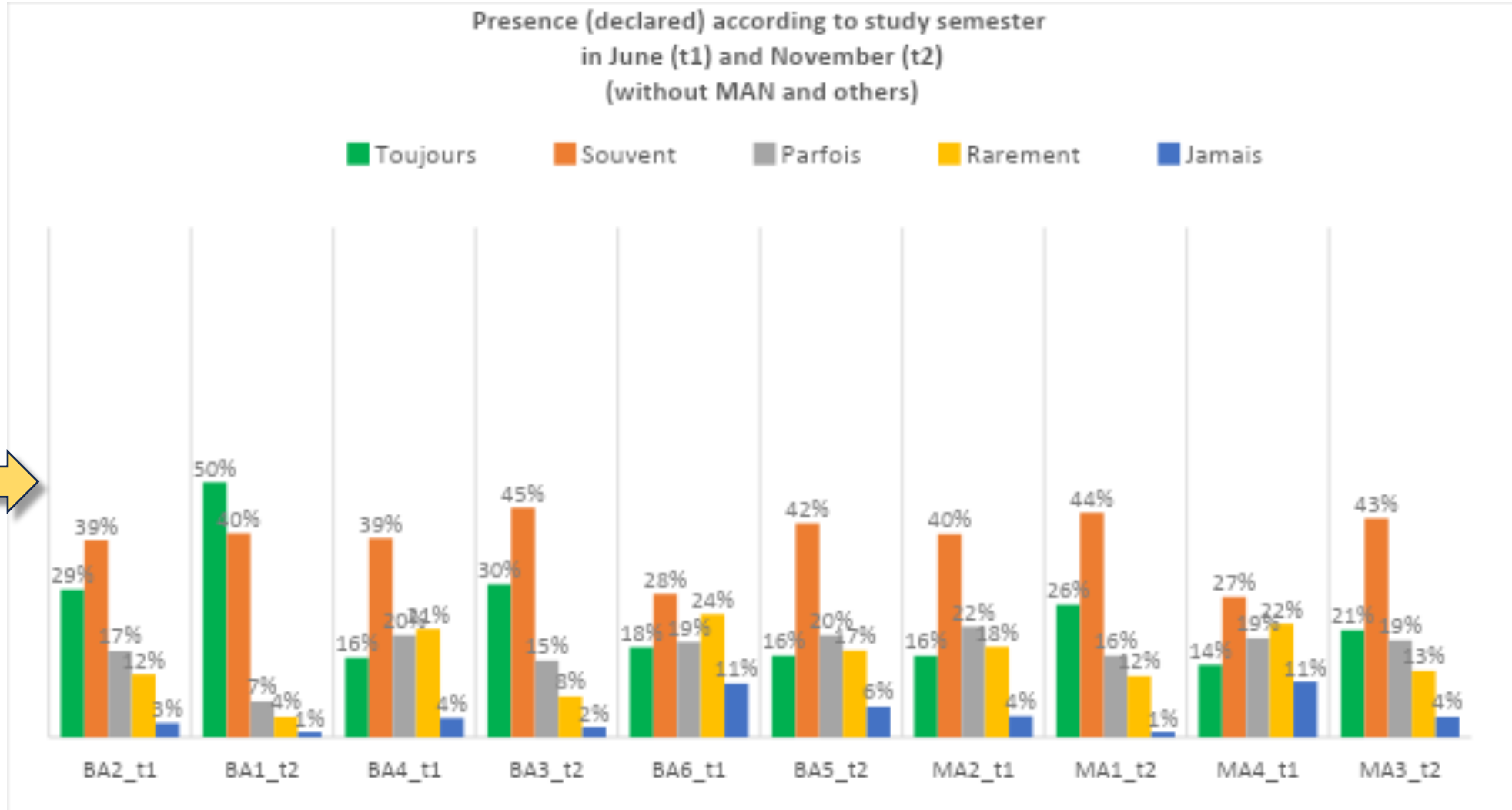
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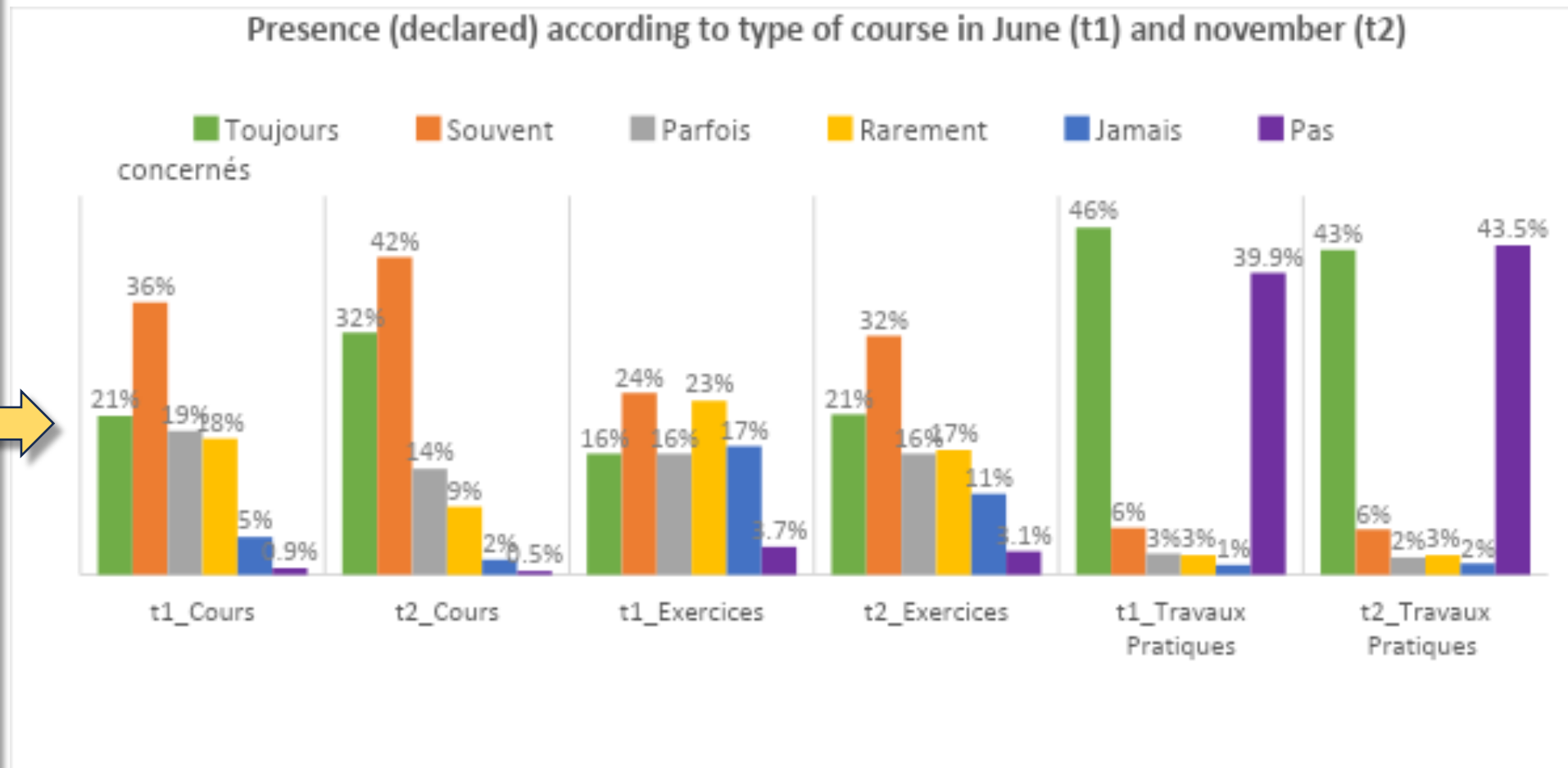
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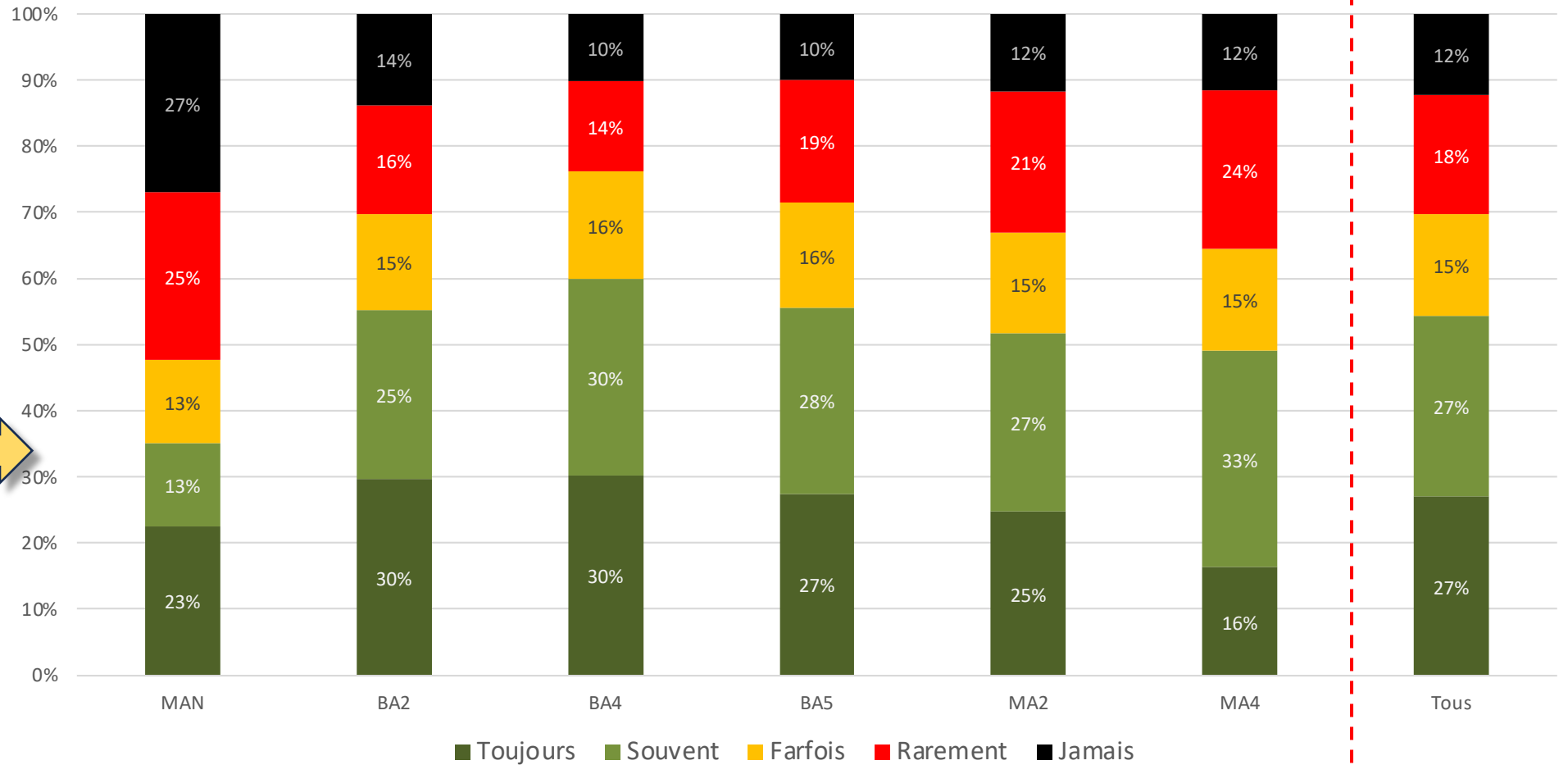


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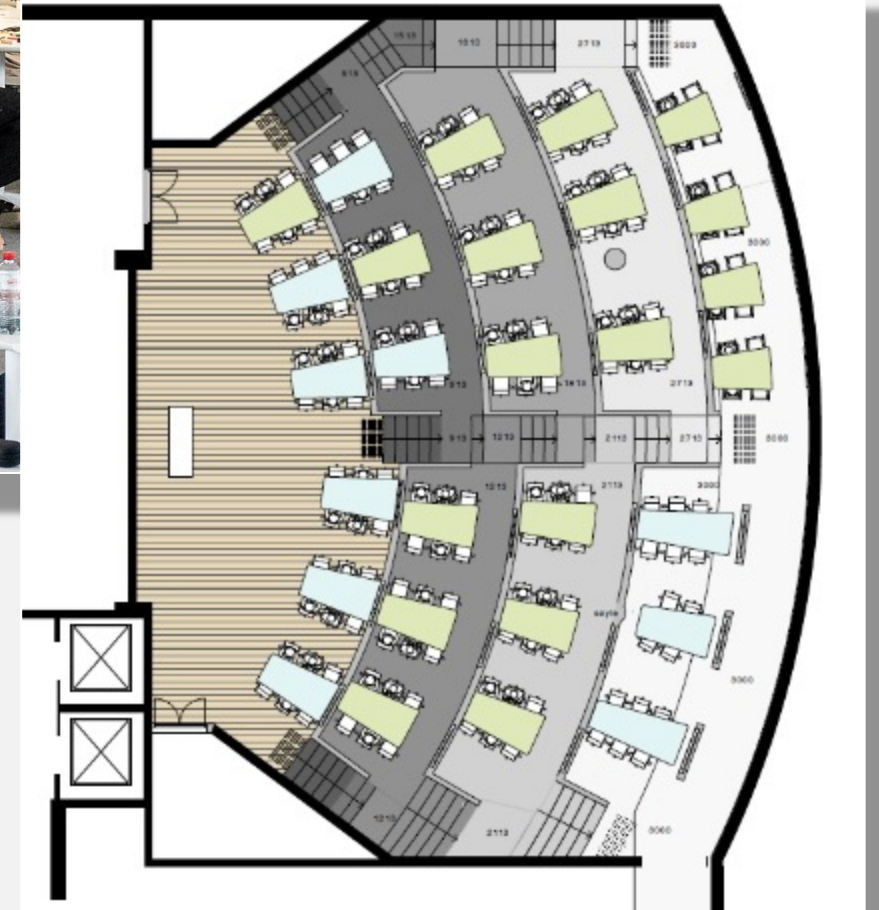
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Quand vous n'assistiez pas au cours, veniez-vous sur le campus ?

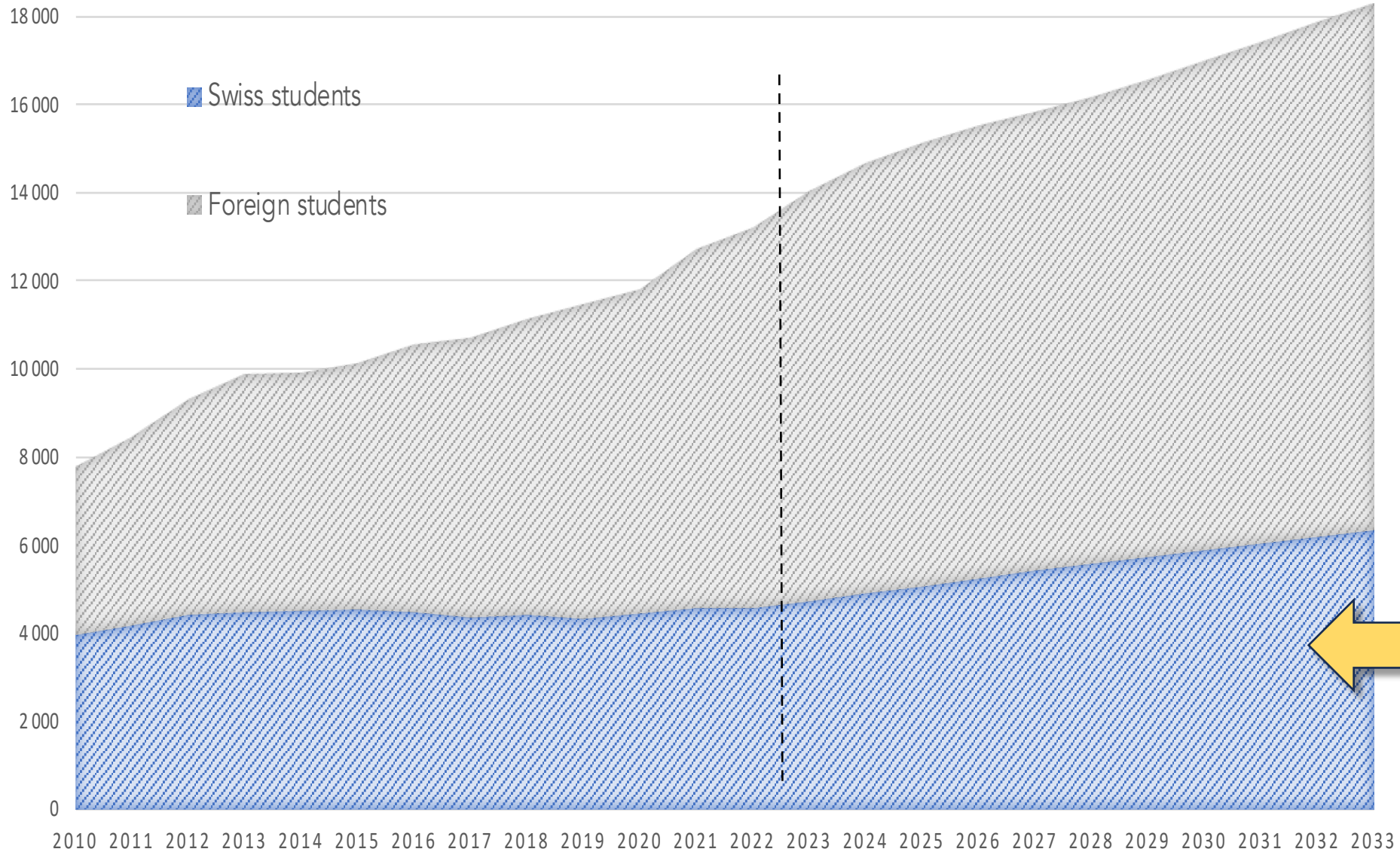


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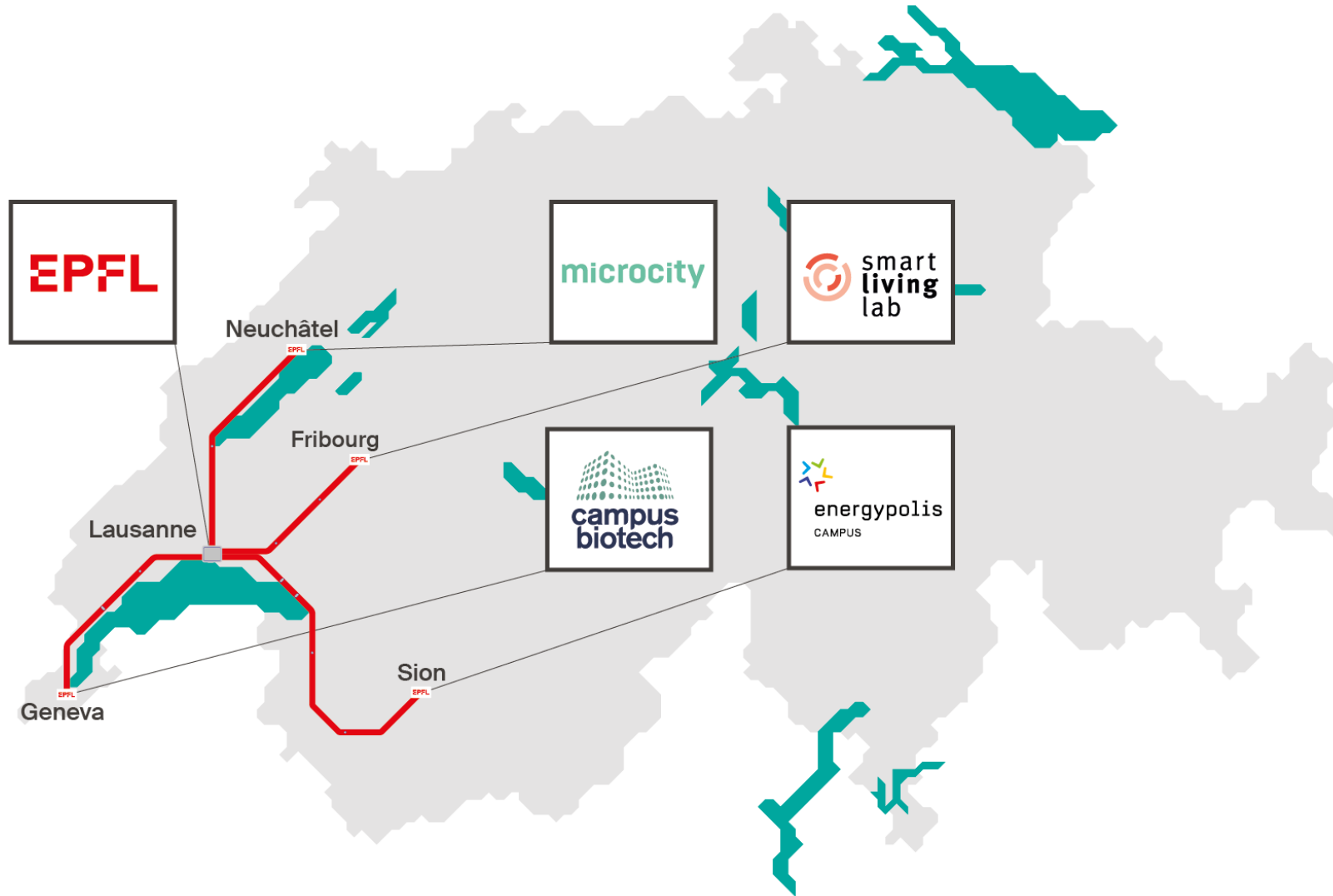
Number of students (predictions)



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Seamless teaching spaces



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Course 101	French	English	German
Classics			
Flipped			
Online			

A red arrow points vertically downwards from the 'Classics' row to the 'Online' row in the 'French' column. A blue arrow points horizontally to the right from the 'Classics' row to the 'German' column.

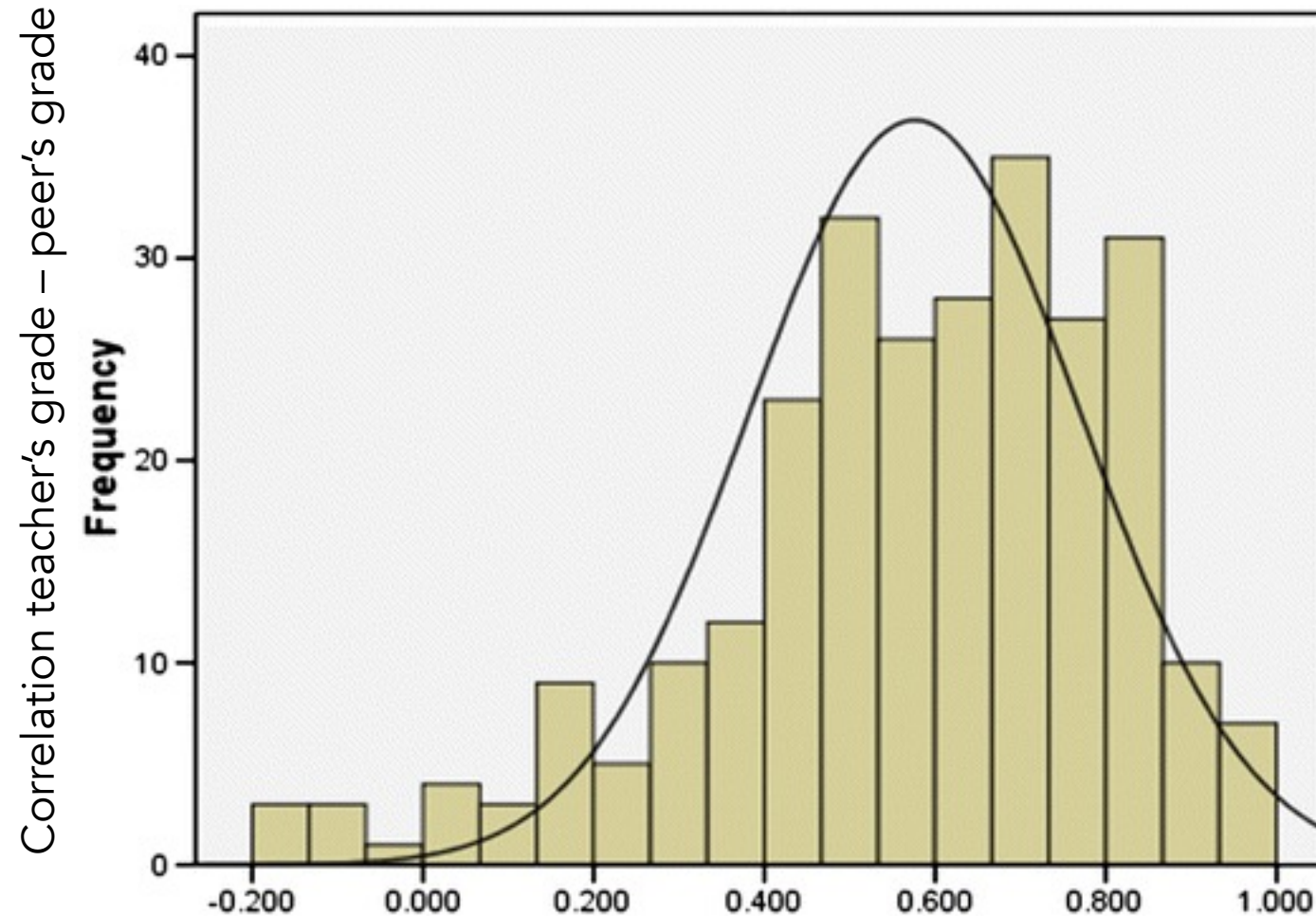
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Peer Grading is reliable

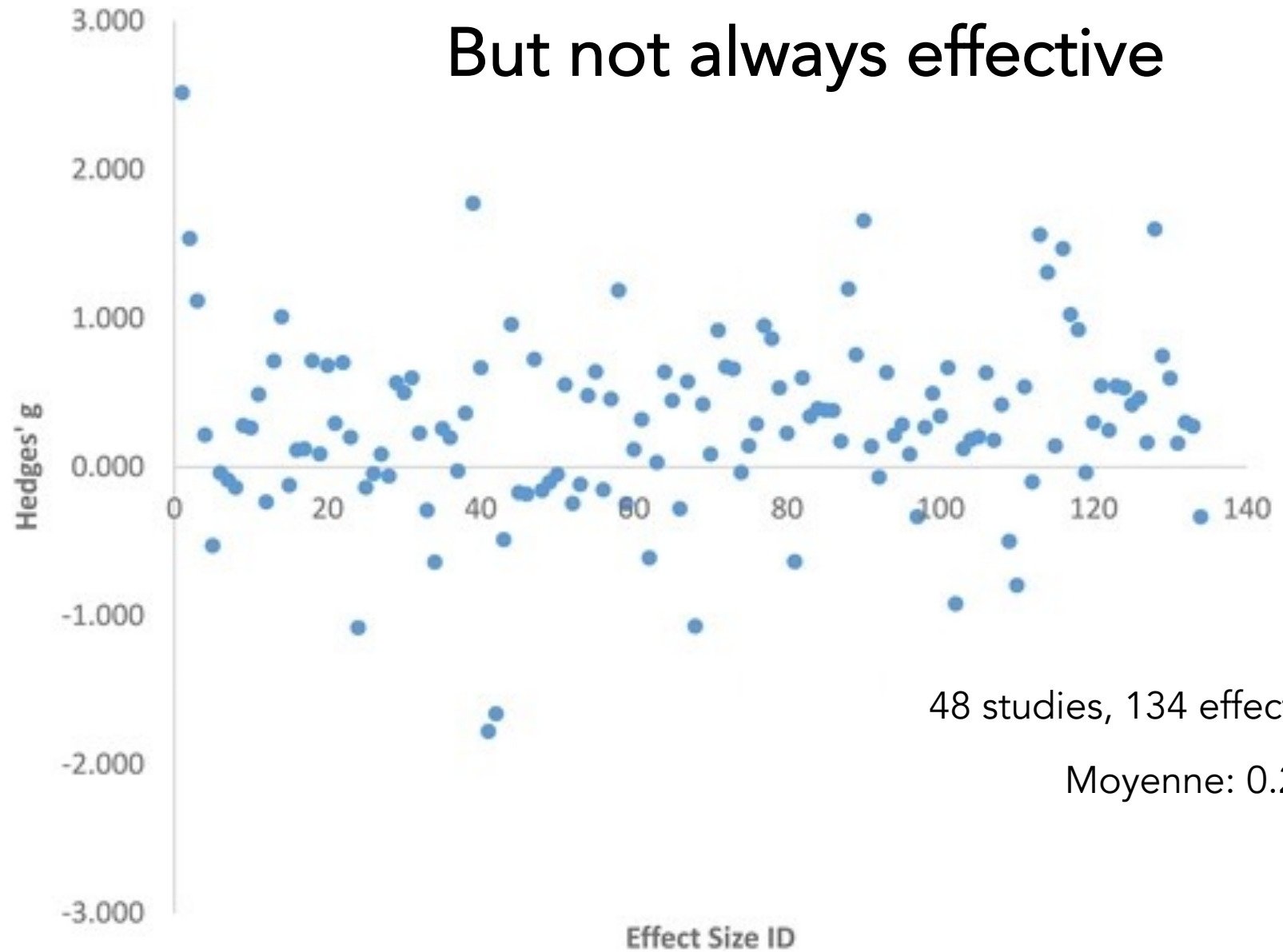
Pearson: .63 ($p < 0.001$)
69 studies, 239 correlations



Hongli Li, Yao Xiong, Xiaojiao Zang, Mindy L. Kornhaber, Youngsun Lyu, Kyung Sun Chung & Hoi K. Suen (2016) Peer assessment in the digital age: a meta-analysis comparing peer and teacher ratings, *Assessment & Evaluation in Higher Education*, 41:2, 245-264, DOI: 10.1080/02602938.2014.999746

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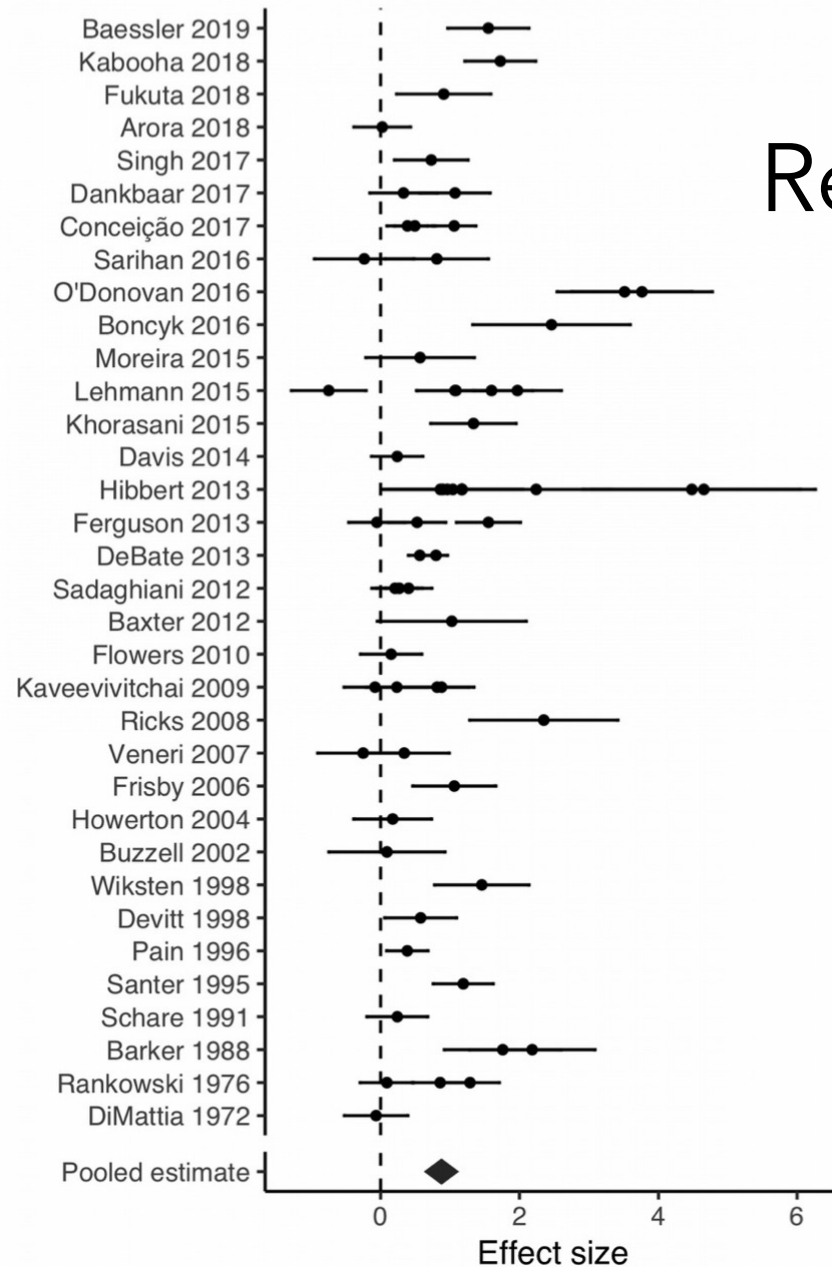


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Effect Size for Each Study That Provided Videos in Addition to Existing Content



Recording course lectures

Videos as a complement improve learning ($g=0.8$)

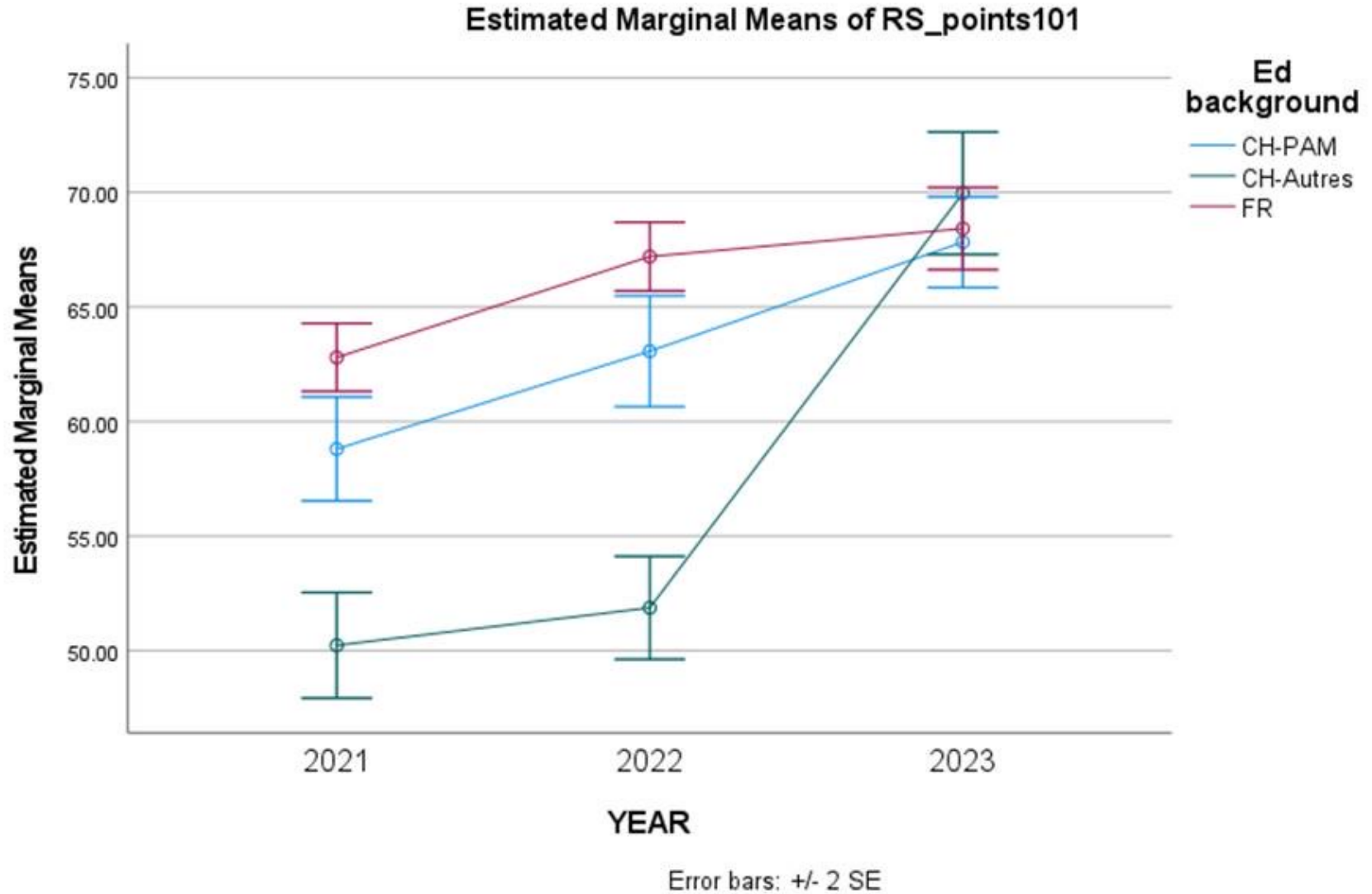
Noetel, M., Griffith, S., Delaney, O., Sanders, T., Parker, P., del Pozo Cruz, B., & Lonsdale, C. (2021). Video improves learning in higher education: A systematic review. *Review of Educational Research*, 91(2), 204-236.

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Adding 30 minutes to the first year analysis exam

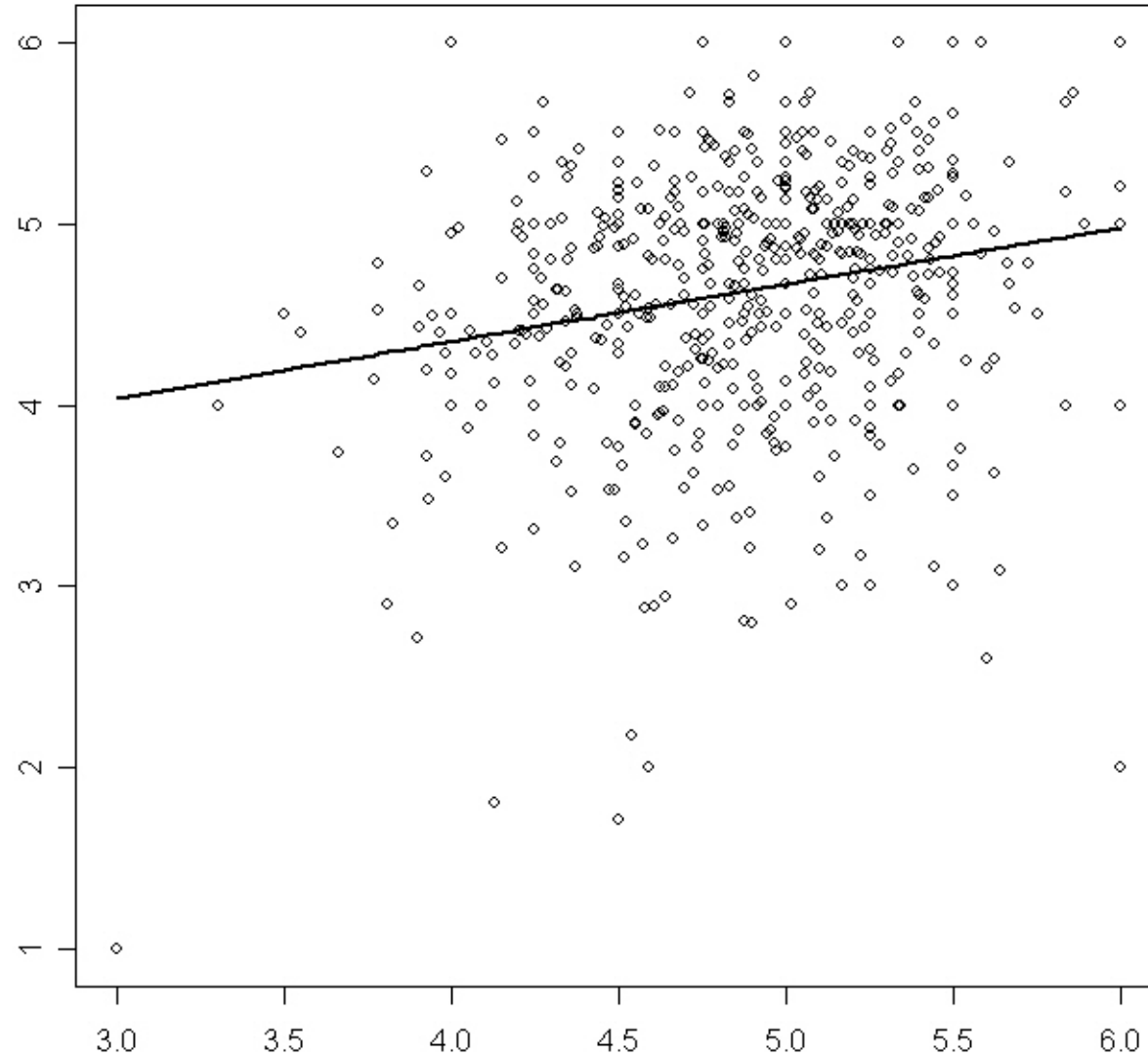


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Do **easier** courses receive better evaluations ?



$r = 0.14$

93+

EdTech Start-ups (as of 01.01.2022)

Swiss EdTech Collider: 100+ start-ups



Our Promise to Youth



A large collage of logos for various EdTech start-ups and organizations. The logos are arranged in a roughly circular pattern around the central text 'Our Promise to Youth'. The logos include:

- SYLVA
- beecome
- catnclever
- FABULA GAMES
- TOTALYIMAGE
- Classtime
- Dybuster
- NEOCOSMO
- SLX
- tthf media
- WYBLO
- GRAINES ENTREPRENEURS
- InnovaKods
- AIM FBK
- KINAPS
- educreators
- coopacademy
- Alcrowd
- kokoro
- lingua
- MaxBrain
- wooclap
- ENLIGHTWARE
- mobsya
- GalliLearn
- UbiSim
- DUAL
- wisy
- Learning Analytics
- MATRIX
- ISYFL<>W
- the experience accelerator
- Calerga
- fuel
- MOBILE TIC
- smarttravel
- JACOBS FOUNDATION
- CVCube
- mirabilo
- explore-it
- AIM FBK
- LABSTER
- Get More Brain
- eSkills
- storm
- EPFL EXTENSION SCHOOL
- EPFL
- Innovation Park
- dynamilis
- PUPIL
- einfach.schule
- FLOURISTER
- betterment of work
- TEACHY
- testwe
- martest
- MEGAVERSE
- taskbase
- WISY
- Learning Analytics
- CVCI
- CHAMBRE VAUDOISE DU COMMERCE ET DE L'INDUSTRIE
- Collaboration Design
- EMPOWERMENT LAB
- educabay
- PocketCampus
- Klewel
- the webcasting company
- zoe
- elever
- GYMITRAINER
- MAGMA Learning
- ayaru
- PositiveImpact.Space
- proov
- GOODWALL
- WorkStreams
- Simpliquity
- WeWent

What I did **not** talk about

(Research on learning technologies: AR, VR, HRI, CSCCL,..)

1. Mental health
2. Student record system / simplify admin processes
3. Teaching evaluation system
4. Optimisation of teaching resources
5. MAKE projects
6. Sustainability curriculum
7. Learning Sciences in an engineering school
8. **How to remove one course?**