

Is it Worth Attending Classes in-person? A Post-COVID Study in ICT University Courses

by

Alfredo Capozucca and Luis Leiva

Department of Computer Science
University of Luxembourg

Once, upon a time ...



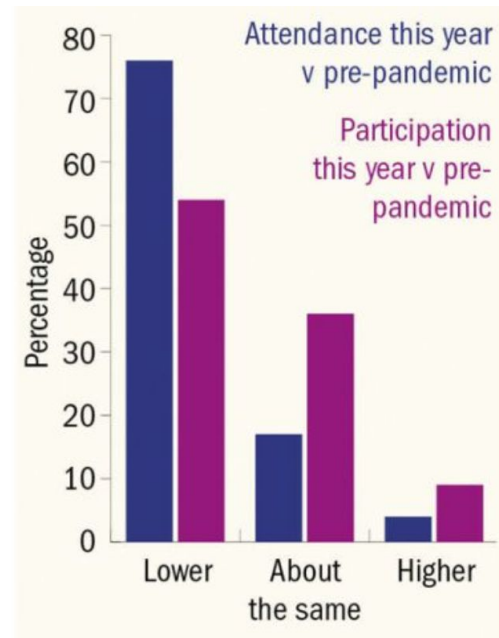
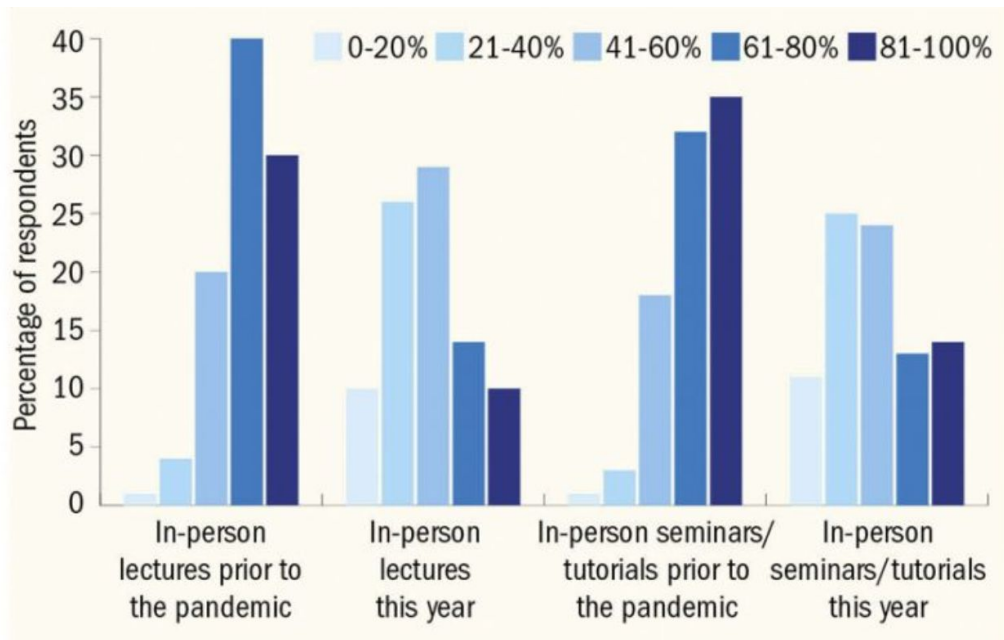
Aberystwyth University students attending a lecture. Photograph: Alamy. Source: [The Guardian](#)

Today



[Photo by Changbok Koon Unsplash](#)

Isolate situation?



Population: 339 responses given by academics, the majority of whom were based in the UK

Source: Class attendance plummets post-Covid, survey conducted by Times Higher Education (THE), June 2022. [Link](#)

Why does it happen? Based on THE survey

Factors

- not wanting to come to campus
- undertaking paid work
- experiencing mental health issues
- failing to do enough preparation

Why does it happen? Our thoughts

Assuming:

- No mandatory attendance
- Full time availability (i.e. not part-time work or similar)
- No health issues

Factors:

1. the grading criteria: it determines what the student has to reach to pass the course
2. the assessment method: it determines how the student will be tested
3. the teaching methodology: it determines how students learn and get trained

Is it a problem?

For universities:

- Costs
 - Course administration (Secretaries, Teachers and Director)
 - Student support (TAs)
 - Classrooms/Labs
 - Equipment

For students

- Academic performance?

Research question

- RQ (v1) Does class in-person attendance have an impact on the student's performance?

... or putting the question in a measurable form:

- RQ (v2) Is there any correlation between attendance rates and the achieved grades for a **given course**?

Pilot study (1/3)

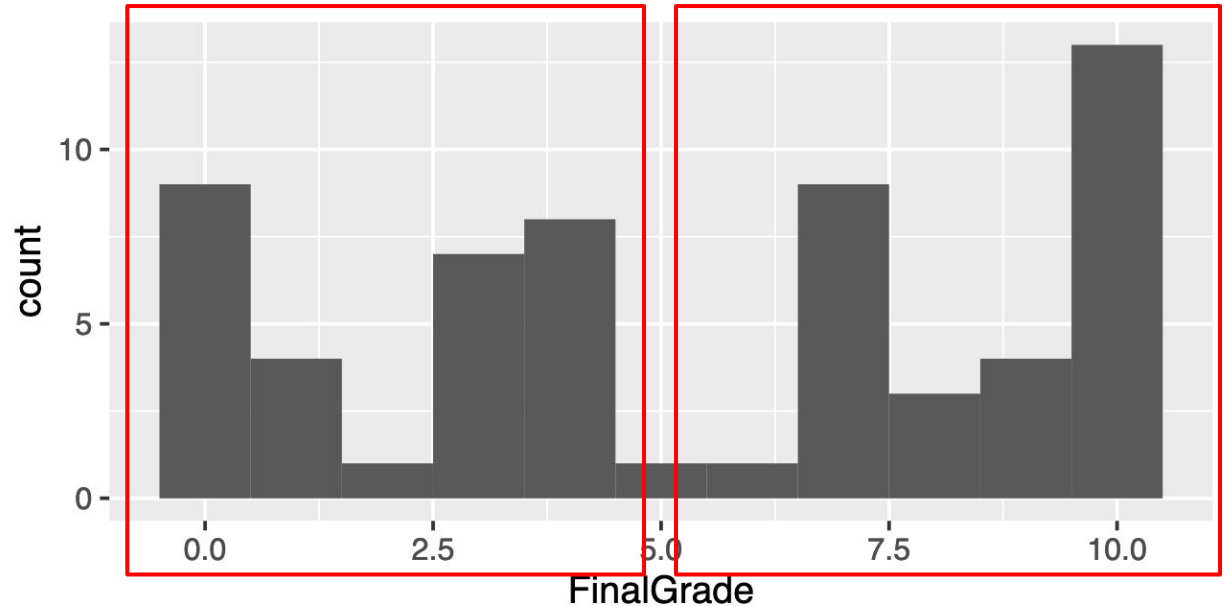
Academic performance

Code assignment week 2
Grade: [0..10]
Passing grade ≥ 5

Group 1: 29 students
Group 2: 31 students

Distribution of grades

N=60 students



Group 1

Group 2

Pilot study (2/3)

Question:

is there a statistically significant difference between **grades** attained by:

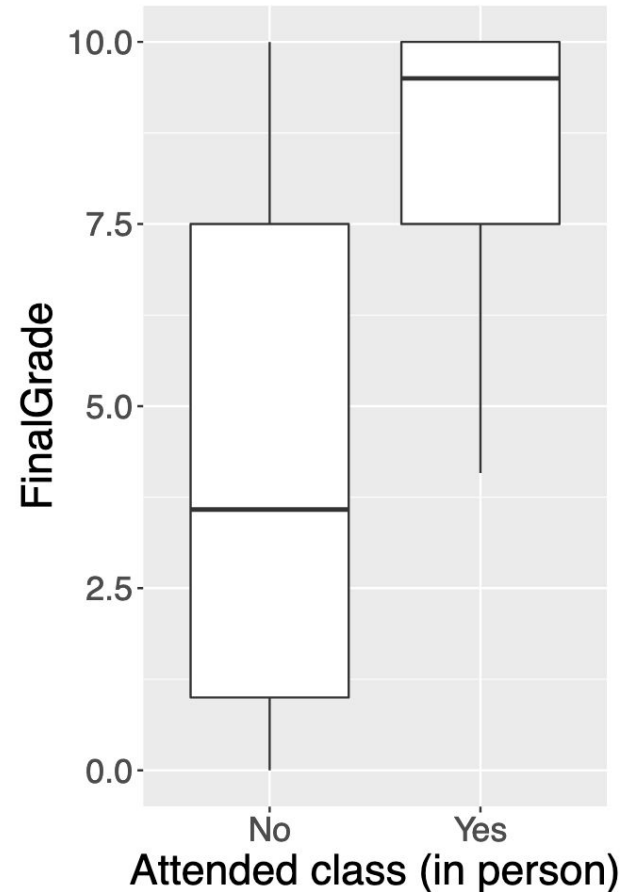
- students who **attended** in-person week 3, and by
- students who **did not attend** in-person week 3?

Answer:

Statistical analysis via one-tailed two-sample t-test

$t(58) = 4.4313, p < 0.0001, d = 1.313$

The effect size (Cohen's d) suggests a **large importance** of the results.



Pilot study (3/3)

Question:

Is there a correlation between grades (assignment week 2) and attendance (week 3)?

Answer:

Pearson's product-moment correlation.

$$\rho = 0.5, p < 0.0001$$

In behavioural sciences (Pagano, 2010), $\rho > 0.5$ is considered to be a strong correlation.

(Pagano, 2010) [Pagano, R.: Understanding Statistics in the Behavioral Sciences. Wadsworth, Cengage Learning \(2010\)](#)

Planned Study (1/)

Participants

- Students in Bachelor in Computer Science (BiCS), winter semester 2022-2023
 - Year 1: student ≈ 75 , courses = 6
 - Year 2: student ≈ 35 , courses = 5
 - Year 3: student ≈ 35 , courses = 5

Variables

- **(Independent) Course attendance rate:** the number of physical attendance of a student to each scheduled session of a given course. Number between 0-100.
- **(Dependent) Academic performance:** final grade a student gets after course completion. Number between 0-20 (Passing grade 10 or higher)

Planned Study (2/)

Hypothesis

Assuming \mathcal{A} and \mathcal{G} are random variables, we define:

- Null hypothesis $H_0: \rho(\tau_l^a \leq a_j^i \leq \tau_u^a, \tau_l^g \leq g_j^i \leq \tau_u^g) \approx 0$.
- Alternative hypothesis $H_a: \rho(\tau_l^a \leq a_j^i \leq \tau_u^a, \tau_l^g \leq g_j^i \leq \tau_u^g) \neq 0$.

with

$$\rho(\mathcal{A}, \mathcal{G}) = \frac{\mathbb{E}[(\mathcal{A} - \mu_{\mathcal{A}})(\mathcal{G} - \mu_{\mathcal{G}})]}{\sigma_{\mathcal{A}}\sigma_{\mathcal{G}}} \quad (1)$$

where


$\sigma_{\mathcal{A}}$ is the standard deviation of the attendance rates,

$\sigma_{\mathcal{G}}$ is the standard deviation of the grades, and

$\mathbb{E}[\cdot]$ is the expected value of a random variable with finitely many outcomes.

Expected conclusions

	H0 (there is not correlation)	Ha (there is a correlation either + or -)
Student	<ul style="list-style-type: none"> Likely to repeat the same behaviour in the next term for “similar” courses. 	<ul style="list-style-type: none"> (- corr) ↓attendance / ↑performance <ul style="list-style-type: none"> Likely to repeat the same behaviour in the next term for “similar” courses. (- corr) ↑attendance / ↓ Performance <ul style="list-style-type: none"> Likely to give negative feedback to the course. (+ corr) May explain your grade.
Instructor	<ul style="list-style-type: none"> Likely to repeat the same behaviour in the next term. Good to let student know at the first session. 	<ul style="list-style-type: none"> (- corr) ↓attendance / ↑performance <ul style="list-style-type: none"> Double-check if ILOs are acquired. <i>Hybrid? Online? MOOC?</i> (- corr) ↑attendance / ↓ Performance <ul style="list-style-type: none"> Dig student’s feedback. Perform a deep reflection. Interview students. (+ corr) Good to let student know at the first session.

Course director/QA officer 

Construct validity

- Academic performance
 - Precision? Guaranteed as we have access to the final grades of every single student
- Course attendance rate
 - Precision? More complicated. Strategy is to combine data from multiple sources
 - LMS
 - Survey students
 - Survey instructors
 - Keep only courses for which consistent attendance rates were found among different sources.

That's all.
Thank you for your attention.

Questions?