# When Results of Teaching Evaluation do not Mirror the Students' Voice:

# Practical Guidance from the University of Teacher Education Vaud in Lausanne

hep/ haute école pédagogique vaud

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## Direction's request

At the University of Teacher Education Vaud, the quality of teaching is assessed by selecting a sample of modules every semester and inviting all enrolled students to evaluate them by completing an online questionnaire.

Based on these data, **the direction asks that an annual result is computed for the whole institution**.

**What calculation should be done on the data to accurately reflect the voice that students gave through their answers?**

## Theory

In this poster, we take advantage of Cashin's (1995) distinction between **"evaluations"**, which refer to **the student answers**, and **"ratings"**, which refer to **the data** to be interpreted.

- In terms of *answers*, teaching evaluation questionnaires provide information on the quality of the education received by giving the students a voice
- In terms of *data*, teaching evaluation questionnaires deliver results that offer valuable guidance for pilots and teachers in education systems (Centra, 1993)

Viewing student evaluations as data rather than as answers may help to **raise the issue of the accuracy of the results on which guidance is based.**

## Data set

❖ Student evaluations of the modules they attended during the 2016-2017 academic year.

❖ **64 modules** out of 224 were evaluated by **2,108 student ratings**, with a **response rate of 35%**.

***There are three kinds of lies: lies, damned lies and statistics***

***popularized by Mark Twain***

## Four calculation methods

To calculate the requested overall score, we highlight **4 possible methods**, each based on **a specific modeling approach**:

**Calculation 1:** *Computing the average of all student ratings*

✗ Level of data analysis: **students exclusively**
✗ Correct calculation for data arising from a **Simple Random Sampling**
✗ Disregarding the fact that the ratings are nested within the modules, a **biased result** is obtained

**Calculation 2:** *Computing the average of student ratings per module*

✗ Level of data analysis: **modules exclusively**
✗ Correct for a **One-stage Sampling** of modules, which would have been evaluated by *all* registered students
✗ Disregarding the fact that variable response rates from one module to another *(non-response error)* result in unequal sampling fractions, a **biased result** is obtained

**Calculation 3:** *Weighting each module's score according to the proportion of its respondents*

✓ Level of data analysis: **students x modules**
✓ Corresponds to the level of data collection: calculation relies on a **Two-stage Modeling** that truly reflects the hierarchical structure of the data
✗ Omitting the fact that both modules and student ratings are samples *(sampling error)*, this result is **incomplete**

**Calculation 4:** *Adding the confidence interval (CI)*

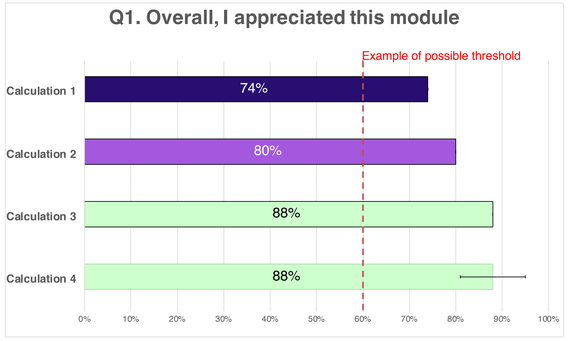
**THE ONLY CORRECT ONE**

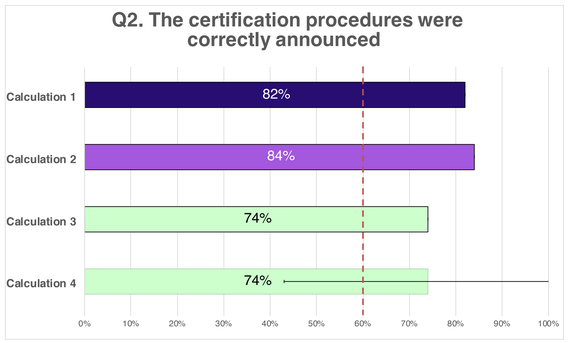
✓ In order for the previous result *(sample statistic)* to be used as **an estimate of the population parameter**, its *confidence interval* must be calculated: CI quantifies the confidence that can be placed in the overall annual result

## Illustration on two questions

The requested overall annual score is **the proportion of positive evaluations**.

Each of the 4 methods produces a specific result.




| | Level of analysis | Adherence to the sampling design | Relevant statistical modeling | Weight-adjusted for bias due to non-response error | Sampling error calculated |
|---|---|---|---|---|---|
| Calculation 1 | Student | no | Simple Random Sampling | no | no |
| Calculation 2 | Module | no | One-stage Sampling | no | no |
| Calculation 3 | Student x Module | yes ✓ | Two-stage Sampling ✓ | yes ✓ | no |
| Calculation 4 | Student x Module | yes ✓ | Two-stage Sampling ✓ | yes ✓ | yes ✓ |

## Proper answer to direction

Applying the only correct method – Calculation 4 – to respond to the direction's request, we can communicate the following, taking for example Question 1:

➢ The result for the 64 surveyed modules *(sample result)* is **88%**

➢ And we are 95% confident that **the proportion of all students that appreciated their teaching is between 81% and 95%**

Note that **CI** per se also act as an **indicator of the quality of teaching**:

- Small CI indicate a strong consensus, both between student answers and module ratings
- Large CI denote wide variability, which may be due to either student answers (intra-variability) or differences between modules (inter-variability), or both

## Tips

**We hope this poster encourages making explicit the statistical modeling that orients the calculations:**

☑ Use the calculations ordered by the sampling plan

☑ Compensate for the non-response error with the appropriate weighting

☑ Report confidence intervals

*Our warmest thanks to Erika Antal, PhD in statistics and senior researcher at FORS (Swiss Center of Expertise in the Social Sciences, University of Lausanne), for her expert and smart assistance in statistical modeling.*

Cashin, W.E. (1995). *Student ratings of teaching: The research revisited* (Idea Paper, 32). Manhattan: Kansas State University (Center for Faculty Evaluation and Development).

Centra, J.A. (1993). *Reflective faculty evaluation: enhancing teaching and determining faculty effectiveness*. San Francisco: Jossey-Bass.