

Interpolated Median and Semi-Interquartile Range in Learning and Teaching Evaluation Reports

The summary reports for information collected through 'Student Evaluation of Learning and Teaching' (SELT) questionnaire show *Median* (ACU uses *interpolated Median* and *Semi-Interquartile Range* values for each rating-type item).

The Median value is used, rather than a Mean (or Average) value, for the following reasons:

- The 5 options used in SELT questionnaire are on an ordinal (or a ranking) scale, and such measurements are not suitable for the calculation of Means (Means are used for interval scale measurements).
- Medians are less affected by a few 'outliers' (ratings in an extreme position of the rating scale) than the Means, in particular when the sample/population size is small.

The standard Median indicates the central position in a spread of responses (that is, the point which separates the lower 50% of responses from the upper 50% of responses on the ranking scale). However, different response distributions can have the same standard Median value, as illustrated below; even though Class A has a different spread of responses than Class B, the standard Median=4, because the middle point out of a total of 11 responses happens to be in the 'Agree' category (Rating Scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree).

Responses in Class A: 1,2,2,3,3,4,4,4,4,5,5

Responses in Class B: 3,4,4,4,4,4,4,5,5,5,5

The interpolated Median recognises that people who have chosen a particular rating category are likely to hold different perceptions of that category. For instance, those who selected the 'Agree' responses in Class A (or Class B) could have different levels of agreement, and each 'Agree' response can be somewhere in the range 3.50 to 4.49 on the 5-point scale. Based on the assumption that the responses within a category are evenly distributed within that category's range, the interpolated Median (IM) can be calculated as follows:

IM = M – 0.5 + (0.5N – n₁)/n₂, where **M** is the standard Median, **N** is the total number of responses, n₁ is the number of responses below the category which contains the middle point, and n₂ is the number of responses in the middle point category; in the event n₂=0, then IM=M.

Using the above method, the interpolated Median for:

$$\text{Class A} = 4 - 0.5 + (11/2 - 5)/4 = 3.62$$

$$\text{Class B} = 4 - 0.5 + (11/2 - 1)/6 = 4.25$$

This (interpolated) Median gives a better estimate of the middle point of the responses.

Semi-Interquartile Range (SIR) is a measure of the spread of responses (similar to *Standard Deviation* which is usually given with the Mean). If the spread of responses is divided into 4 equal parts, then *the Interquartile Range* is between 25th and 75th percentiles, and SIR is one half of that range.

Note: The information provided here was adapted from http://www.spu.edu/depts/insdev/interpolated_median_explanation.pdf and <https://ro.umich.edu/faculty-staff/teaching-evaluations/departments/interpolated%20median>