Using Canonical Correlation and Heliographs to Measure and Visualise the Impact of a Flipped Political Science Class on Students' Hard and Soft Skills

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The Flipped Classroom (FC) has become quite common in a wide range of disciplines, such as engineering, education, languages, medical and social sciences. The majority of publications have focused on measuring its impact on students' hard skills, such as their academic achievement, calculated in terms of grades. Other publications have focused on measuring students' satisfaction with the technique. Finally, few other publications have measured its impact on students' soft skills, such as the perception of learning, teamwork, critical thinking, or self-efficacy. Nevertheless, there is virtually no systematic study that has measured whether there is any statistical correlation between the hard and soft skills of students exposed to the FC.

For this reason, we conducted a quasi-experiment, in which a group of students was divided into two subgroups. In one group, we taught a Political Science Class of Latin-American studies through the FC, while in the other group we taught the same class through a traditional teaching format. After collecting data about students' hard and soft skills, we used canonical correlations to measure whether there is any correlation between these two sets of variables. Canonical correlation is a useful multivariate technique to detect whether and how two sets of variables correlate. Moreover, since the results of canonical correlation are usually not reader-friendly, we presented our results by using heliographs, a method of data visualization in which the information related to different subsamples is shown simultaneously. This can greatly help the process of designing evidence-based pedagogical strategies.

Teaching innovation; Political Science; Hard Skills; Soft Skills; Canonical correlation

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