

# Sentiment analysis on university students' evaluation of teaching and their emotional engagement

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Teaching practices have been widely studied in relation to students' outcomes, positioning themselves as one of their strongest catalysts and influencing students' emotional experiences. In the higher education context, teachers become even more crucial as many students ground their decisions on which courses to enrol in based on opinions and ratings of teachers from other students. Unfortunately, sometimes universities do not provide the personal, social, and academic stimulation students demand to be actively engaged. To evaluate their teachers, universities often rely on students' evaluations of teaching (SET) collected via Likert scale surveys. Despite their usefulness, such method has been questioned in terms of validity and reliability. Alternatively, researchers can rely on qualitative answers from open-ended questions. However, the unstructured nature of the answers and the large amount of information obtained requires an overwhelming amount of work. The present work presents an alternative approach to analyse such data: sentiment analysis. To the best of our knowledge, no research before has included results from SA into an explanatory model to test how students' sentiments affect their emotional engagement in class.

The sample of the present study included a total of 225 university students (Mean age = 26.16,  $SD = 7.4$ , 78.7 % women) from the Educational Sciences faculty of a public university of Spain. Data collection took place during the academic year 2021-2022. Students accessed an online questionnaire using a QR code. They were asked to answer the following open-ended question: "*If you had to explain a peer who doesn't know your teacher how he or she communicates in class, what would you tell them?*". Sentiment analysis was performed using Microsoft's pre-trained model. Reliability of the measure was estimated between the tool and one of the researchers who coded all answers independently. The Cohen's kappa and the average pairwise percent agreement was estimated with ReCal2. Cohen's kappa was .68 and the agreement reached was of 90.8%, both considered satisfactory. To test the hypothesis relations among SA and students' emotional engagement a structural equation model (SEM) was estimated.

Results demonstrated a good fit of the data: RMSEA = .04, SRMR = .03, TLI = .99, CFI = .99. Specifically, the results showed that student's sentiment regarding their teachers' teaching positively predicted their emotional engagement ( $\beta = .16$  [.02, .30]). In other words, when students' opinion towards their instructors' teaching practices is positive, it is more likely for students to engaged emotionally in the subject. Altogether, results show a promising future for sentiment analysis techniques in the field of education. They suggest the usefulness of this tool when evaluating relations among teaching practices and student outcomes.