2SDR METHODOLOGICAL STRATEGY FOR TEACHING AND LEARNING STATISTICS IN INDUSTRIAL ENGINEERING STUDENTS

Blanca Robles
Science Department, Private University Antenor Orrego, Perú
<broblesp@upao.edu.pe>

BACKGROUND: Statistics being the "science of data"; Difficulties arise in teaching subjects in continuous change and growth (Batanero, 2000), in addition there are didactic and epistemological obstacles that are presented to students in understanding the various statistical concepts (Batanero, Godino, Green, Holmes, Vallecillos, 1994). Demonstrating that the application of the "Methodological Strategy 2SDR" develops statistical competencies in the third cycle Industrial Engineering students of the Private University Antenor Orrego, was the objective of this work.

METHOD: The "2SDR Methodological Strategy" based on the principles of constructivist learning theories (Díaz-Barriga & Hernández, 2010) and on "learning to learn" (Menoreo, Castelló, Clariana, Palma & Pérez, 1997); It is structured in four stages: the first, called "Search", here the student visits the website of the "open data" portal in Peru (Kitchin, 2016) and performs a search for a set of data, specific to their interest in working ; the second stage is called "Scraper", where the student extracts the selected data set and begins to carry out an exploratory study of them; The third stage, called "Data concert", is the stage where the student "makes the data speak" using different statistical techniques. The fourth stage "Report" corresponds to the textual construction of the statistical analysis of the data. The "2SDR Methodological Strategy" was applied in a group of 50 students in the descriptive Statistics course, during an academic semester and with the permanent support of the teacher.

FINDINGS: The T-Student mean comparison test determined a significant statistical difference ($p<0.05$) between the scores of the
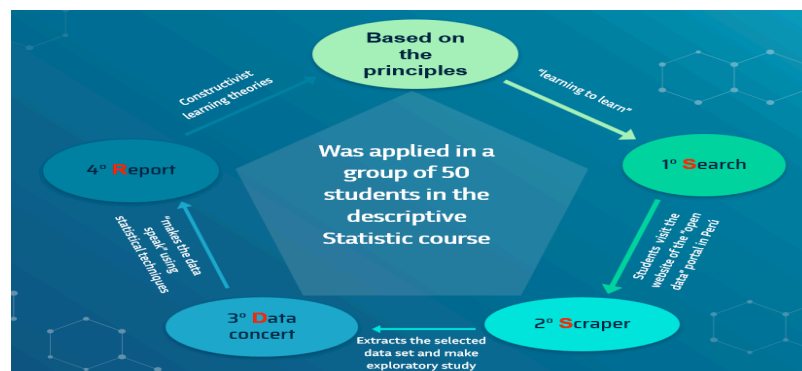

Figure 1. The 2SDR methodological strategy

performance test before and after the experience; In addition, 95% of the students stated that the use of "open data" and the application of the "2SDR Methodological Strategy" allowed the understanding of statistical concepts and the consolidation of their learning.

CONCLUSIONS: The "2SDR Methodological Strategy" develops statistical competencies in students, is a practical way of transferring knowledge and constitutes a powerful new route of work in teaching and learning statistics.

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