

Underlying Reasons for Different Learning Approaches in Statistics in Turkish Universities

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Statistical literacy and the application of statistical techniques to problems at hand have become important during the last couple of decades due to massive data collections made possible by technological advances. Many higher education degree programs have since included statistics courses in their curriculums to better prepare their graduates for the work environment, and enable them to deploy evidence based practices in their work. The degree to which graduates will be able to gain useful knowledge from the statistics courses they study is dependent on the learning approaches they utilise. The aim of this study was therefore to investigate students' learning approaches in statistics units, and relate these to background variables such as age, gender, study work load and their time at university. The results of this study might shed light into curriculum development in the future for such statistics units and enable students to choose deeper approaches to their learning. We surveyed almost 500 students in six Turkish universities to investigate the relationship between student characteristics and the learning approaches they utilise in the study of statistics. The preliminary results of our analyses showed that there were statistically significant positive correlations between all three learning approaches; however the strength of the correlation for the deep and strategic approaches was three times higher than the correlations between deep and surface, and strategic and surface approaches. Students who completed high school in a city other than where their university was located had lower learning approaches scores for all three approaches, but only surface and strategic approach scores were statistically significant. The year at university and whether the student worked during the semester were negatively correlated with strategic learning approaches. The analysis also showed that when students stated that they liked studying, their deep and strategic approach scores were higher and surface approach scores lower. In addition, if they stated they liked studying mathematics in high school, students had statistically significantly higher deep approach scores. When students considered enrolling into a higher degree in the future, they had significantly higher deep approach scores, and when they did not consider the same option they had significantly higher surface approach scores. The perceived usefulness of statistics was negatively correlated with surface approach scores. Finally, students' expected grade for their statistics unit was highly related to their learning approaches; higher expected grades were associated with higher strategic approach scores and lower surface approach scores.

Keywords: Statistics education; Engineering and Statistics; Deep approach to learning