

University and High School Students' Perceptions of the Nature of Science: The Effect of Gender, Class, Specialty and Reported Ability in Science

Abstract

Students' ideas of the nature of science (NOS) influence their learning processes and understanding of science. This influence has attracted researchers' attention to this area for decades. What mainly differentiates the current study from previous studies is the comparison that it makes between ideas about NOS that university students hold vs. those held by high school students, in addition to comparisons between NOS ideas related to other background variables: gender, specialty, and scientific ability.

The participants were 421 secondary and university students: 226 high school students and 195 university students. The students were asked to complete a questionnaire developed by McComas and Olson and which examines four aspects of NOS ideas: philosophical insights, sociological insights, psychological insights and historical statements and assumptions. Computing t-test and f-test values, we found significant differences between students' NOS ideas that could be attributed to the class in the philosophical and sociological insights, where university students had higher averages in NOS ideas than high school students. The current study also found significant differences between students' NOS ideas attributed to their specialty in three of the four aspects of the NOS: the philosophic, the psychological, and the sociological, whereas the difference was not significant in the historical aspect. Further, the results indicated a significant difference between students' NOS ideas that could be attributed to their reported ability in science in the philosophical aspect and the whole NOS ideas.