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Personality, Adjustment, and Engineering Identity among College Engineering Students: A Machine Learning Approach

Abstract:

This study examined whether and to what extent general personality traits based on the Big Five model (McCrae & Costa, 2003), vocational personality types based on Holland's Self-Directed Search (1985), and students' adjustment to college as measured by the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1999) predicted academic achievement and engineering identity among undergraduate engineering students by using machine learning models. We cast predicting cumulative Grade Point Average (CGPA) and engineering identity measure (EIM) as two separate binary classification tasks in which machine learning models were trained to recognize students who achieved above-average CGPA and EIM scores. For the CGPA, we identified 12 features with above-average contributions to the model output. Of these, all were positive predictors except for SACQ-PEA, NEO-Extraversion, SACQ-ATT, and NEO-Neuroticism. For the EIM, we identified 11 features with above-average contributions to the model output, all of which were positive predictors. NEO-Neuroticism was a negative predictor, and its contribution was slightly below average (i.e., ranked 12th). Personality factors and adjustment play an important role in college engineering students' academic performance and engineering identity.

Biography

Yi Ding, Ph.D., is a professor of School Psychology. Ding went to the University of Minnesota Medical School for her internship in Pediatric Psychology and Pediatric Neuropsychology rotations. She received her Ph.D. in School Psychology from the University of Iowa. Her research interests include learning disabilities, developmental disabilities, STEM learning, and special education and school psychology issues based on a multicultural perspective.