Session A2:
Tests and prediction of student succes

Paper 04

Using a math test to predict engineering students' success

Program text

Are math tests able to predict Danish engineering students' study progression? Findings indicate that the act of volunteer test participation is more decisive than the actual test score.

Abstract

Introduction

Shortage of STEM graduates causes concern throughout Europe (Business Europe, 2011). International studies suggest that math skills have predictive value regarding STEM students' study success (Moses et al., 2011). This study explores the value of a test in basic math skills with regard to student drop-out in the context of Danish engineering education.

Method

Students completed the math test in the first week of their studies. The test has previously been used to assess the effect of an online educational resource (Midtiby and Ahrenkiel, 2015). In total, 221 students from the year group 2014 were included in the study; 75 had graduated, 35 were still active and 111 had left their studies.

Results

Students, who participated in the math test (n=176), generally had greater success in their studies than students, who did not participate in the test (n=45). The portion of students who graduated, still were active and had dropped out was significantly different between participating and non-participating students (χ^2=11.038, p=0.004). Students, who completed their studies within the standard time limit gained higher test scores (M=22.8, SD=6.36) than students, who left their studies (M=19.8, SD=5.35) (p=0.005). No significant differences in test scores were detected between students, who were still active students (M=20.4, SD=5.62), and students, who had left their studies (p=0.869), nor between active students and graduates (p=0.118).

Discussion

Findings suggest that volunteer participation in math tests has greater predictive value with regard to retention than the actual test score. Statistical significance was detected in the different test scores between graduates and student who did not complete their studies. But this difference represented a small effect size. The study contributes to the discussion on admission tests in Danish higher education and to the institutions' desire to identify students at risk of drop-out early in their studies.

Authors

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Literature

Business Europe (2011). *Plugging the Skills Gap: The clock is ticking.* Retrieved from: https://www.businesseurope.eu/sites/buseur/files/media/imported/2011-00855-E.pdf

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Moses, L., Hall, C., Wuensch, K., et al. (2011). Are Math Readiness and Personality Predictive of First-Year Retention in Engineering? The Journal of Psychology, 145:3, 229-245, doi:10.1080/00223980.2011.557749.