Machine Learning and Big-Data Analytics Identify Well-being Predictors to Students’ Academic Achievements Globally

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INTRODUCTION

- Well-being is related to academic achievement (e.g., Korhonen, Linnanmäki, & Aunio, 2014).
- However, past research mostly relied on traditional statistics (i.e., correlation, ANOVA, linear regression) on limited samples
- To address these gaps, we will test this relationship again using big-data analytics with a world-wide database.

METHOD

- Data downloaded from https://www.oecd.org/pisa/data/2018database/
- Only 9 countries completed the well-being section of the PISA report
- Set up the ind. variable (all PISA well-being factors) and dep. variables (math and science scores) using plausible values
- Analytics performed in JMP

RESULTS

- Social engagement plays a crucial role in academic achievement.
- Median smoothing supports this finding
  - Higher peer engagement -> higher academic achievement among math and science scores
  - Bagging and Boosting models do not have much distinction -> either works
  - Policy maker vs. Statistician?
  - Only 9 countries completed the 2018 PISA well-being, thus cannot be attributed to ALL cultures.

DISCUSSION

- Pattern Recognition
  - Median Smoothing displays a CLEAR trend

For further questions, please contact Zizhong (David) Xiao at zizhongxiao17@apu.edu and visit his website at: https://zxiao003.wixsite.com/mysite