Engineering Technology Students' Self-Regulation: A Baseline

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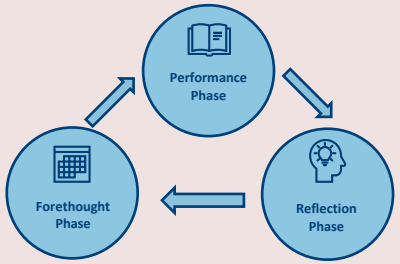
Lifelong Learning (LLL) and Self-Regulation

- LLL competencies are necessary to prepare one for a life full of successful learning
- No consensus in literature as to what subcompetencies make up LLL [1]
- *Self-Regulation* [2] has been proven to be an essential, malleable competency for LLL [3] that can be used as a proxy for it in an educational context [4]



Self-Reflection and Insight Scale (SRIS)

- 20-item validated self-report questionnaire developed by Grant et al. in 2002 [5]
- Intended 3-factor structure that has been confirmed by Roberts and Stark [6]:
  - Engagement in Self-Reflection
  "I frequently take time to reflect on my thoughts"
  - Need for Self-Reflection
  "It is important to me to try to understand what my feelings mean"
  - Insight
  "My behavior often puzzles me"
- 5-point Likert scale

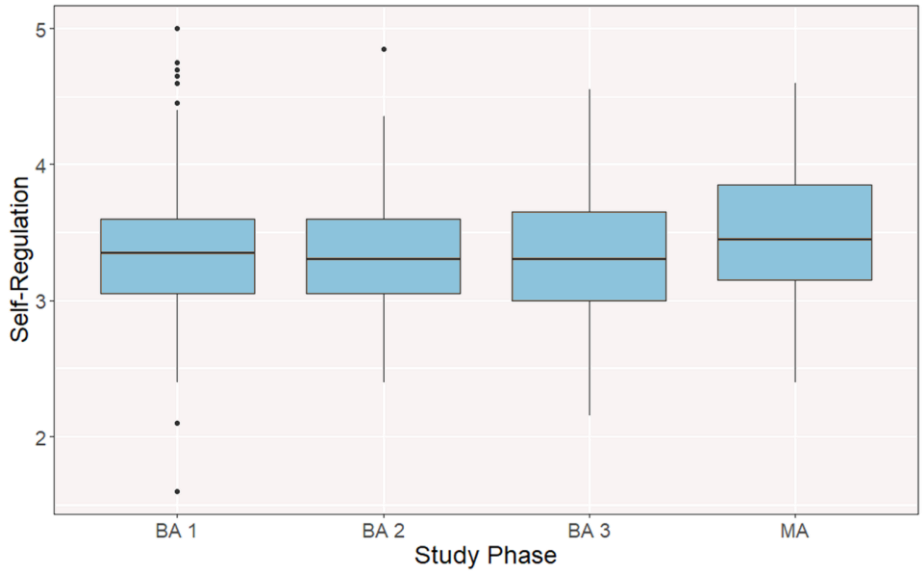
Research Questions

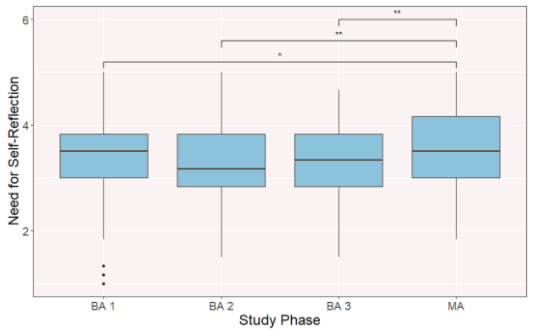
1. What are Flemish engineering students' baseline self-regulation levels?
2. Can any differences be observed between students of different study phases?
3. Can any differences be observed between students of different educational backgrounds?
4. Can any differences be observed between male and female students?

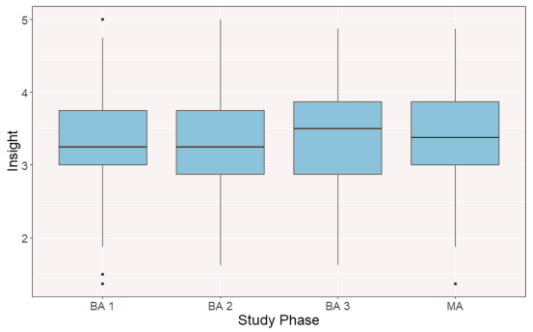
Data Collection & Analysis

- All study phases of Engineering Technology program (n = 783, 26% response rate)
- Means calculated over factors as well as one over all items (self-regulation as a whole)
- Statistical tests employed:
  - ✓ Kruskal-Wallis
  - ✓ Post-hoc Wilcoxon
  - ✓ Cohen's d

Results







Discussion

- Similar results to those of Grant et al.'s psychology students [5] except for insight
- Medicine students rate themselves higher than engineering students on all subscales [3, 6]
- Male and female engineering students rate themselves differently on the SRIS subscales, in contrast with Roberts and Stark's medicine [6] and Grant et al.'s psychology [5] students
- Engineering students exhibit no differences across study phases in terms of self-regulation, engagement in self-reflection and insight, in line with Roberts and Stark's findings [6]
- Higher need for self-reflection towards the end of the engineering program, in contrast with Roberts and Stark's medicine students [6]

Next Steps

- Measurements repeated for three more years → natural growth model
- Results supplemented with extra data:
  - ✓ Qualitative insights (interviews)
  - ✓ Additional quantitative questionnaire
  - ✓ Intervention on self-regulation

[1] Cruz, M. L., Saunders-Smits, G. N., & Groen, P. (2020). Evaluation of competency methods in engineering education: a systematic review. *European Journal of Engineering Education*, *45*(5), 729-757.
[2] Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into practice*, *41*(2), 64-70.
[3] Naeimi, L., Abbaszadeh, M., Mirzazadeh, A., Sima, A. R., Nedjat, S., & Heyri, S. M. (2019). Validating self-reflection and insight scale to measure readiness for self-regulated learning. *Journal of education and health promotion*, *8*.
[4] Stefanou, C., Lord, S. M., Prince, M. J., & Stolk, J. (2012). The effect of different active learning environments on student outcomes related to lifelong learning. *International Journal of Engineering Education*, *28*(3), 606-620.
[5] Grant, A. M., Franklin, J., & Langford, P. (2002). The self-reflection and insight scale: A new measure of private self-consciousness. *Social Behavior and Personality: an international journal*, *30*(8), 821-835.
[6] Roberts, C., & Stark, P. (2008). Readiness for self-directed change in professional behaviours: factorial validation of the Self-reflection and Insight Scale. *Medical education*, *42*(11), 1054-1063.