

The Proof Is In The Pudding – Using Perceived Stress To Measure Short-Term Impact in Initiatives to Enhance Gender Balance in Computing Education



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1. Problem

- Many initiatives to improve gender balance in STEM use enrolment/retention to show impact [1, 2, 3]
- Enrolment/retention figures take time to obtain [1,2]
- Other initiatives use feedback as their main measure of impact [4,5]
- Need of a reliable short-term evaluation measure

2. Approach

- Review over 400 sources to identify measures of impact used
- Focus on Computer Science (CS) Higher Education, Cohort - Undergraduate Women
- Identify what types of measures are used in what types of initiatives
- Identify an effective and a lightweight evaluation approach to show impact on a short-term

- ### 3. Grouping
- Three main groups of evaluation measures identified: statistical data, feedback and instruments
 - **Statistical data:** Recruitment, Retention & Student Performance data
 - **Feedback:** Perception of CS, Confidence, Intention to Persist, Enjoyment
 - **Instruments:** Sense of Belonging, Machine Learning, Frameworks e.g. NCWIT, promising but not used instruments

4. Mapping onto types of Initiatives

- Using categorisation of initiatives divided into **Policy, Pedagogy, Influence & Support, Promotion & Engagement** [6] to map evaluation measures
- Stat. Data is present across all categories
- Feedback is used in many short-term initiatives
- In many cases – cannot map from a single initiatives to impact
- Small number of instruments used
- Other evidence of impact – anecdotal [7], visitors on website [8], number of interviews or publicity generated [8]

5. Discussion

- A lightweight method of data collection – retrospective post and pre-survey [9]
- Relationship between stress and intention to drop out for science students [10]
- Promising but not used instrument – perceived stress scale (PSS) [11]
- PSS typically contains 10 items [12] but a shorter version – PSS-4 validated as well [13]
- Original version of PSS-4 is not very relevant to context of initiatives in CS education, but can be modified

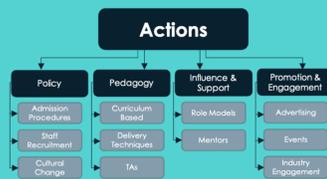
6. Recommendation & Next Steps

- Use Perceived Stress Scale (PSS) to measure initiatives targeting retention
- Use short version of the scale with items 5, 6, 8, and 10 in PSS-10
- Use retrospective post and then pre-questionnaire
- Evaluate an action from TechMate toolkit [14] at TU Dublin using suggested measure of impact



View TechMate

Types of Initiatives (Actions) to Enhance Gender Balance in Computer Education [6]



More on the actions and categorisation



or <https://arxiv.org/abs/2206.06113>

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