Statistics Anxiety and Self-efficacy in Psychology Students: A Challenge for Teaching and Learning in STEM
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BACKGROUND & METHODS

**Importance of Statistics in STEM** Research methods and statistics (RMS) are embedded in the university curricula for psychology, STEM, and more widely. Statistical skills are also associated with the development of psychological literacy and graduate attributes.

**Statistics Anxiety** A major challenge facing the teaching and learning of statistics in HE is the high levels of statistics anxiety and low levels of statistics self-efficacy experienced by students required to learn statistics as part of another course and the negative impact of these factors on academic performance.

**Aim** The purpose of this project was to 1) Identify the prevalence of statistics anxiety and measure statistics self-efficacy in UG and PGT psychology students; 2) Identify perceived causes of statistics anxiety; 3) Establish any practical interventions that could be introduced in attempt to alleviate anxiety and increase self-efficacy.

**Methods** Quantitative and qualitative data were collected, using measures of anxiety (STARS) and self-efficacy (e.g., “Select the correct statistical procedure to be used to answer a research question”).

**RESULTS**

**Statistics Anxiety Prevalence:** Over 50% of UG (N = 54) and PGT (N = 12) students showed moderate/high levels of statistics anxiety. **Figure 1:** UG and PGT students were more anxious about statistics than in psychology in the interpretation, worth & fear of teachers subscales (p < .05).

**Statistics Self-Efficacy Figure 2:** UG and PGT students had higher levels of self-efficacy in their ability to complete psychology related tasks than in statistics related tasks (p < .05). Statistics self-efficacy was positively correlated with students’ statistics course grades (r = .41, p = .006).

**Perceived Causes and Impact Figure 3:** Qualitative analysis indicated students’ perceived causes of statistics anxiety, and the impact on engagement with the course.

**INTERVENTIONS**

**A bag full of books?** Previous work has indicated that the open-book exam format can reduce statistics anxiety. The RMS exam was changed to an open-book format, and over 90% of UG students (N = 40) indicated that this format reduced anxiety and increased their self-efficacy in statistics, compared to the traditional exam format (p < .01).

**Friday Stats Blues?** The RMS lectures were moved from Friday to Wednesday, and 58% of UG students (N = 40) indicated that this would increase their likelihood of attending.

**Because Stats is worth it!** A humorous movie was produced which highlighted the worth of statistics in psychology and as a graduate attribute. This movie reduced UG students’ (N = 40) negative views of the “worth” component of statistics anxiety (M = 27.82, SD = 1.38) compared to a control group (M = 32.38, SD = 1.38, p = .033). However, the level of interpretation anxiety was significantly higher for the experimental group (M = 29.73, SD = .85) compared to the control group (M = 25.42, SD = .85, p = .002).

**FUTURE WORK**

- Develop interactive VLE resources and peer support to accompany RMS lectures.
- Highlight the worth of statistics in course materials, and enhance support for interpretation anxiety.
- Target interventions to those with highest levels of statistics anxiety.

**REFERENCES**