How Can I Reduce Statistics Anxiety in Y1 Psychology Students?: An Action Research Project

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Context

- Action Research project for Module 3 of my PGCAP

- Area of Activity = **A4** (developing inclusive & supportive learning environments)

Reconnaissance

- Discussion with Year 1 & Year 2 Psychology students
- Statistics anxiety is common –unprepared for the amount of statistics in a Psychology course
- Three anxiety sources: statistics, SPSS, interpreting and writing up results for reports
- I am Module Leader for Research Methods 1, and my observations are consistent with this
- I decided that the RM1 aspect of my practice required attention:
  - Concern of statistics anxiety
  - Concern of related disengagement
  - Concern regarding inclusion issues, since stats anxiety may affect BTEC & mature students
  - Concern regarding how this may affect ability to meet NTU learning & teaching policy

Supporting Literature

- Onwuegbuzie (2004) : statistics anxiety can have negative effect on academic performance/engagement

- Can prevent inclusivity:
  - Onwuegbuzie (1999): higher in Black than Caucasian students
  - Bradley & Wygant (1998) : females experience more than males
  - Baloğlu (2003) : statistics anxiety is particularly prevalent in older students.

What Did I Do?

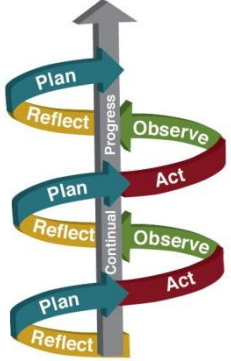
- Reconnaissance provided clear question: *How can I reduce statistics anxiety in Y1 students?*

- Reflected on students' comments, my own observations, and relevant literature:

- Students wanted easy-to-follow and engaging tuition that did not involve being 'talked at'
- I wanted to provide students with materials that were visual and contained little text (thus catering for international, dyslexic, and statistically unconfident students)
- Literature suggested that any materials should be light-hearted(Schacht and Stewart, 1990).

- Chose example of simple linear regression, and created a short 'walkthrough' document
- Used annotated screen-shots, and as little text as possible, and a humorous example study
- Consistent with constructive alignment (e.g., Biggs, 1996), I included learning outcomes, which would ultimately be assessed in the summative report.

Relevance of Action Research (AR)



- Commonly used with the intention of improving practice through addressing a specific issue (Denscombe, 2010).
- Adopted a Practical Action Research approach, which locates me as a 'reflective practitioner' who explores the outcomes of my practice, and considers whether my practice is consistent with my values (McKernan, 2013).
- My reconnaissance revealed a mismatch between my values (the importance of ensuring that all students feel included in class) and my RM1 practice
- Through this project, my aim was ultimately to bring my practice more in-line with my values.

Methodology

- Obtained ethical approval
- Triangulation approach (Bogdan & Biklen, 2006)-qualitative and quantitative data

1. **Survey (*N* = 41)**
2. **Module Opinion Survey Comments (EvaSys)**
3. **Tutor Feedback**
4. **Student Focus Group (*N* = 3)**

1. Survey (*N* = 41)

Variable (all 1-7, where higher values indicate more agreement)	*M* (*SD*)
I feel I better understand what correlational/survey studies are	6.12 (0.75)
I feel I better understand how to enter correlational data into SPSS	6.17 (0.86)
I feel I better understand how to conduct a linear regression in SPSS	6.00 (0.89)
I feel more confident about understanding linear regression SPSS output	5.90 (0.94)
I feel more confident about writing up the results of a linear regression analysis	5.98 (1.06)
I feel more confident about interpreting the results of a linear regression analysis	5.73 (1.07)
I have a better understanding of what is expected of me when I write my regression report	6.02 (0.94)
I feel the 'holidays and happiness' example helped me understand linear regression	6.46 (0.71)

Participants scored significantly higher than the scale mid-point (4) for all items, indicating high levels of agreement with all statements (*p*s < .001).

2. Module Opinion Survey Comments

- “The results document on NOW, as they simplify writing up the results and carrying out the analysis on SPSS. This makes understanding it a lot easier.”
- “I like the sheets given out before writing up a results section as it helps a lot”
- “The step-by-step support documents from Juliet are really helpful and give us a template to build from-thank-you!”

3. Tutor Feedback

- “The document was really helpful in helping the students think about how to structure their results section and complete the analyses”,
- “I think it was probably really useful to create a kind of ‘self-study guide’ for those who were not able to attend. Of course, lack of attendance can be for various reasons, including disengagement, illness, anxiety around stats etc. or caring responsibilities, but regardless of the reason, this would help them to complete the work for the module”;

- Two tutors highlighted the potential issue of ‘spoon feeding’

- However, one tutor also mentioned that Y1 students require a reasonable amount of scaffolding when learning about statistics, and that ‘spoon-feeding’ could be reduced by integrating the document into a well-designed lesson-plan which enables “students to gain a better understanding of what they are doing and, importantly, why”.

4. Focus Group

Maria: “I think that before you’d given it [the document] out, everyone was sort of relying on one person to do it. And then suddenly you gave this out and everyone realised what was going on. And I think about four more people came behind me and they started helping as well, because they understood what was going on as well.”

Kate: “No, I don’t think that [spoon-feeding] is a problem, because we have to be taught everything! I had no idea how SPSS works, and within the module they just give us the hints, and this doesn’t help a lot, because then afterwards we have to go to the workshop again, and find out how this works, and it was very good to just have details in one template.”

Reflection on Findings

- Various methods told a coherent story: students perceived the document positively- felt more confident and aware of what is expected of them in their formative assessment
- Text-light and visual nature of document was appreciated (e.g., by international student in focus group)
- Students and tutors saw the document's potential to make statistically unconfident students feel more able and included in the class
- Tutors' concern about spoon-feeding needs to be considered: placing the document within a clear lesson plan may help to reduce this
- I created a lesson plan as part of my action research project

Reflection on Practice Implications

- Importance of tutors ensuring statistical teaching is inclusive
- Importance of getting students' and tutors' input on the creation of teaching materials
- Importance of ensuring class activities are inclusive and student-centred

Conclusion

- I have now created similar documents for all statistical tests that Y1 students do
- Students have access to these throughout the year
- I intend to continue gathering feedback on these documents and refining them so that the gap between my values and my practice continually reduces

Any Questions?

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Thanks To…

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