A Follow-up Study of Interdisciplinary Learning as Feeling on the I-Explore UG Research Computing Module at Imperial

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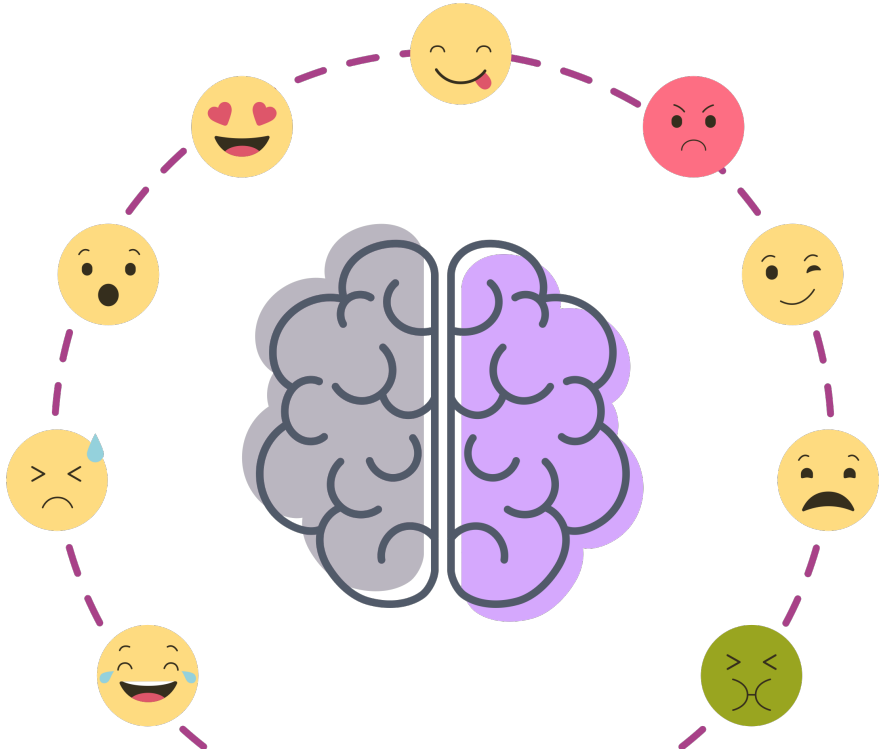
Outline

- Motivation
- Research Questions
- Methods
- Results
- Discussions

Motivation

- Feelings are a crucial aspect of learning and understanding them can help enhance students' learning experience and self-efficacy. [1]
- Being aware of students' emotions is key to developing student-centered teaching and learning pedagogies in higher education. [2]



References:

1. Charalambous M, Hodge JA, Ippolito K. Statistically significant learning experiences: towards building self-efficacy of undergraduate statistics learners through team-based learning. Educational Action Research. 2021;29(2):226-44.
2. Quinlan KM. How Emotion Matters in Four Key Relationships in Teaching and Learning in Higher Education. College Teaching. 2016;64(3):101-11.

Motivation (cont'd)

- The IRC course, which attracts 2nd-year undergraduates from various departments, faces the challenge of accommodating the diverse needs of its students.
- Emotions play a significant role in the learning process, influencing students' experiences as they engage with dynamic computing concepts and collaborate with peers from different disciplines.[3]

References:

3. Lo IF, Chen C-H. Timing of instructional materials and types of gameplay for interdisciplinary learning: A comparative experimental study. Research in Science & Technological Education.1-18.

Research Questions

- How students' feelings evolve throughout the course?
- Will the feeling changes provide valuable insights into the course design?
- Do students' existing computational skills matter?

Methods

- Data were collected
  - anonymously
  - in week 1 and week 10 (both 2023 and 2024) respectively
  - 6 variables: prior programming experience, enjoyment, anxiety, excitement, confusion and curiosity, each on a 10-point continuous Likert scale

Results

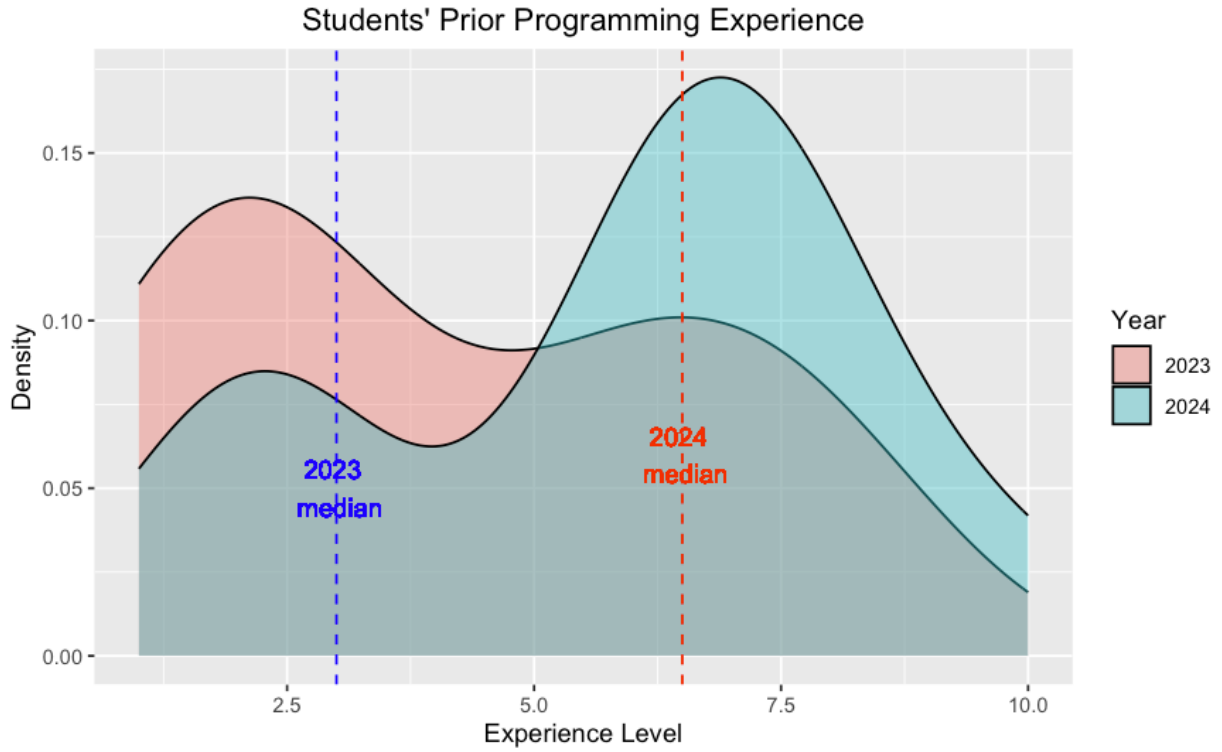
- The data:

13 valid votes
in 2023

14 valid votes
in 2024

Results – Prior Programming Experience

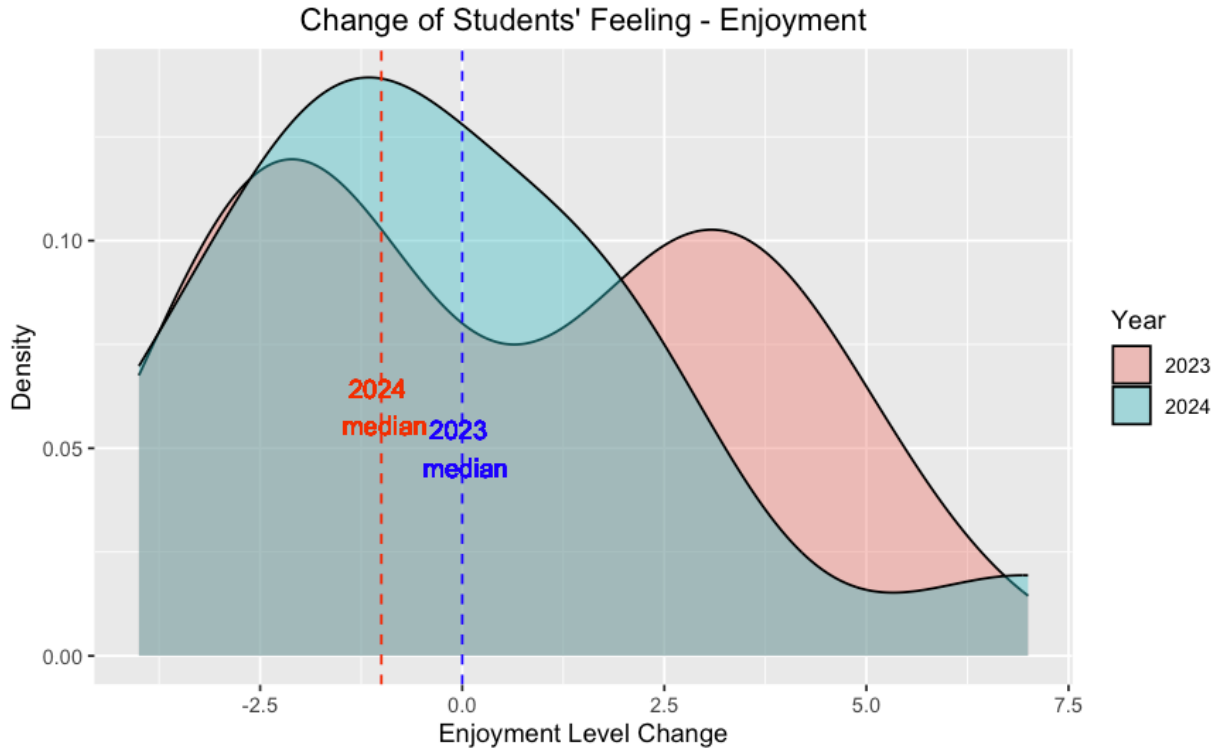
- Comparison of prior programming experience (2023 vs 2024)



mean.sd.2023	mean.sd.2024	t.value	Degree.of.Freedom	p.value
4.2 (2.6)	5.8 (2.5)	-1.642	24	0.113

Results – Change of Enjoyment

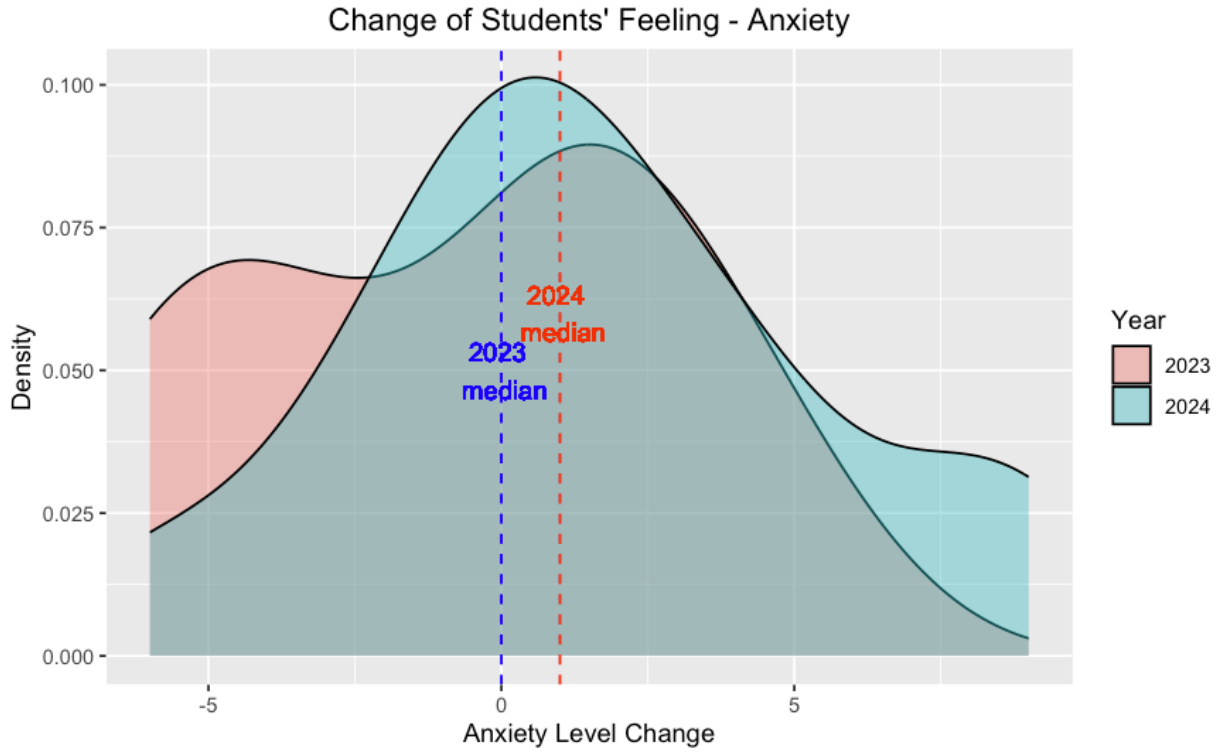
- Comparison of change of enjoyment level from week 1 to week 10 (2023 vs 2024)



mean.sd.2023	mean.sd.2024	t.value	Degree.of.Freedom	p.value
0.46 (2.9)	-0.21 (2.9)	0.603	24	0.552

Results – Change of Anxiety

- Comparison of change of anxiety level from week 1 to week 10 (2023 vs 2024)



mean.sd.2023	mean.sd.2024	t.value	Degree.of.Freedom	p.value
-0.69 (3.8)	1.5 (4.1)	-1.445	24	0.161

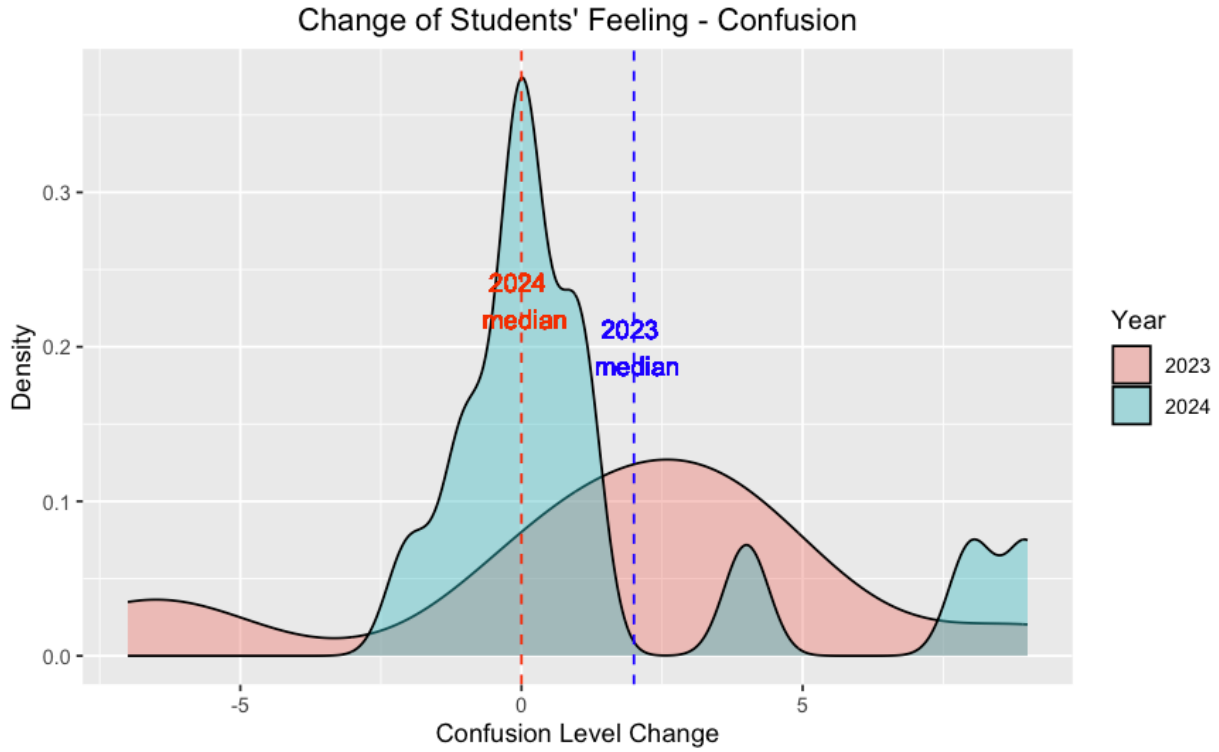
Results – Change of Excitement

- Comparison of change of excitement level from week 1 to week 10 (2023 vs 2024)

mean.sd.2023	mean.sd.2024	t.value	Degree.of.Freedom	p.value
0.15 (2.5)	0 (3.6)	0.129	23	0.898

Results – Change of Confusion

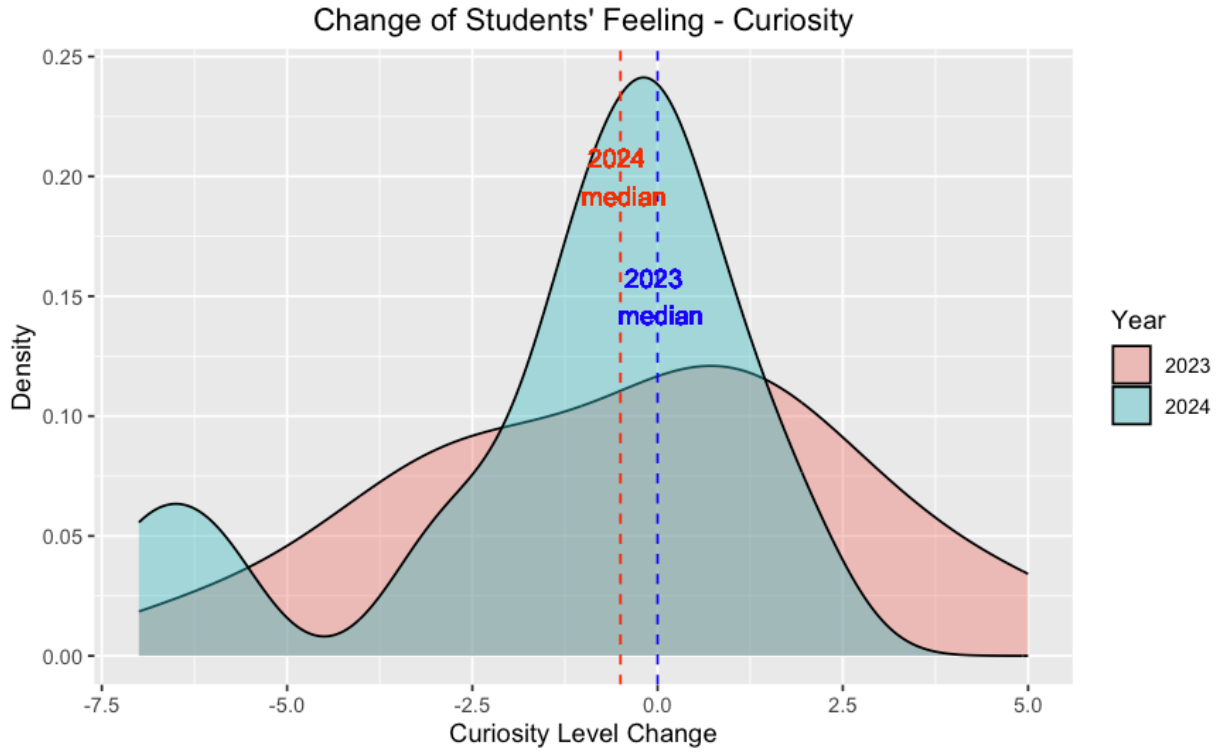
- Comparison of change of confusion level from week 1 to week 10 (2023 vs 2024)



mean.sd.2023	mean.sd.2024	t.value	Degree.of.Freedom	p.value
1.5 (4.3)	1.4 (3.3)	0.074	22	0.941

Results – Change of Curiosity

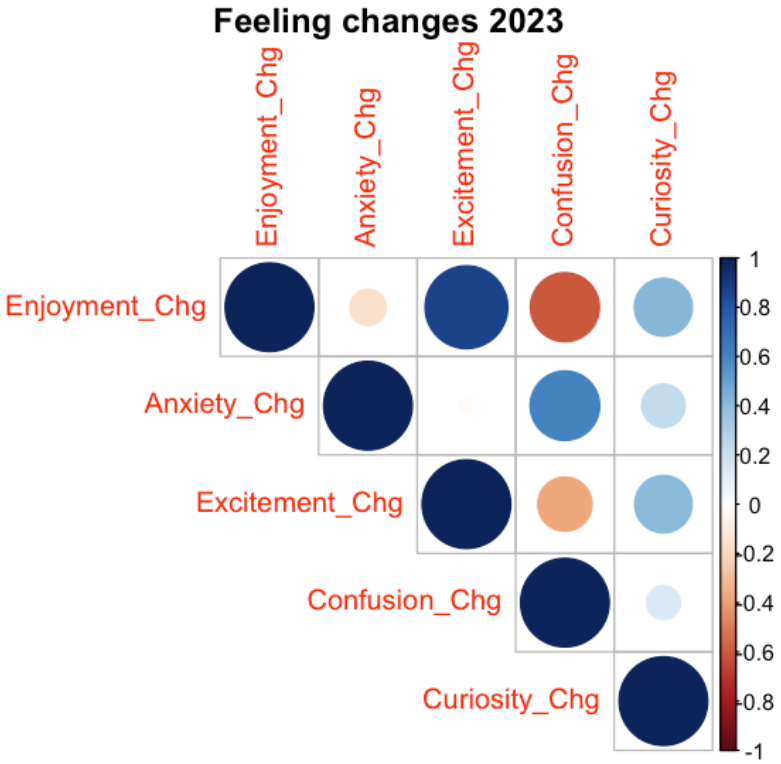
- Comparison of change of curiosity level from week 1 to week 10 (2023 vs 2024)

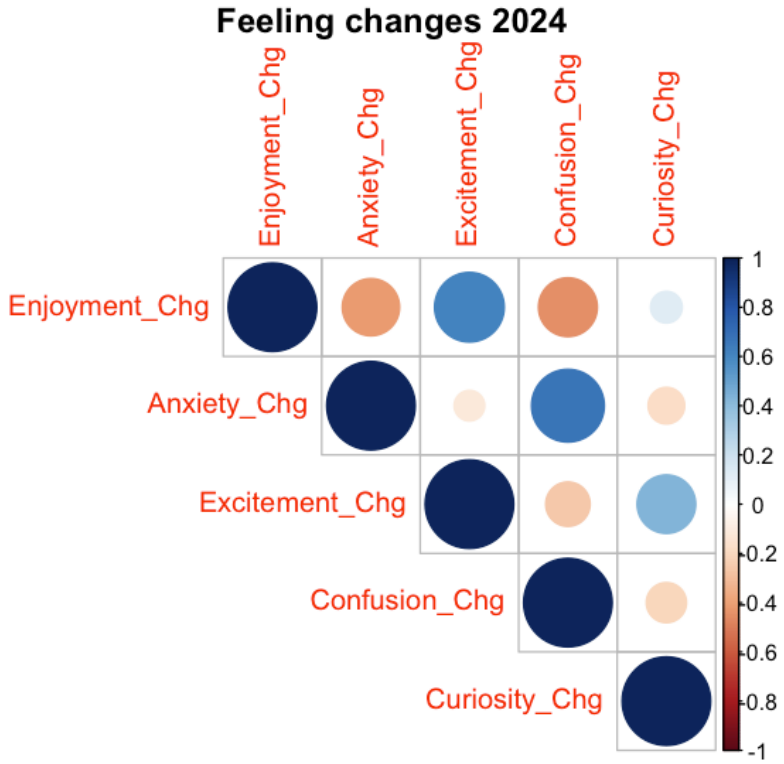


mean.sd.2023	mean.sd.2024	t.value	Degree.of.Freedom	p.value
-0.31 (3)	-1.2 (2.6)	0.842	23	0.408

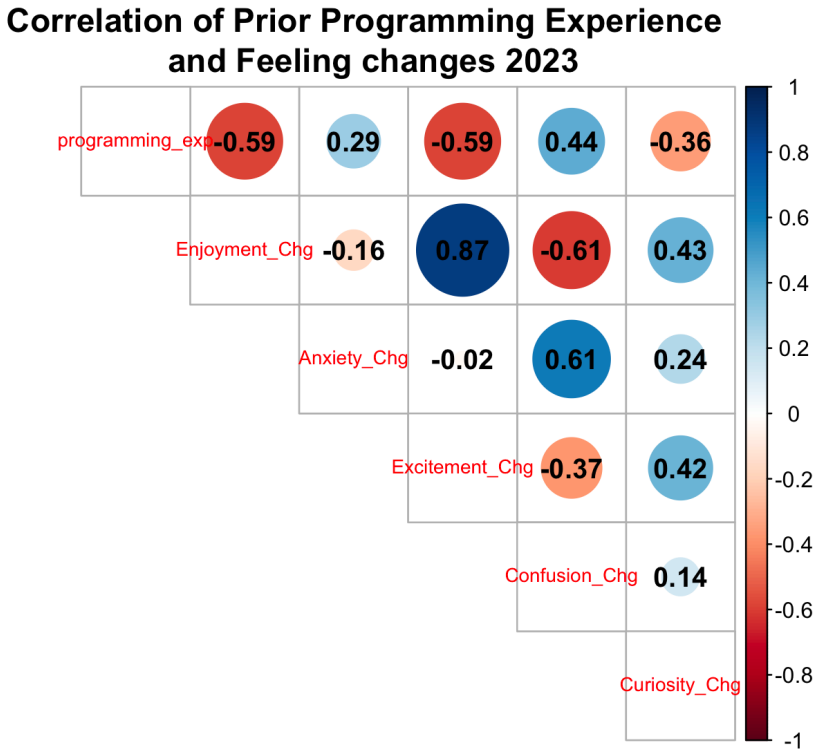
Results – Feeling Changes Correlation Map

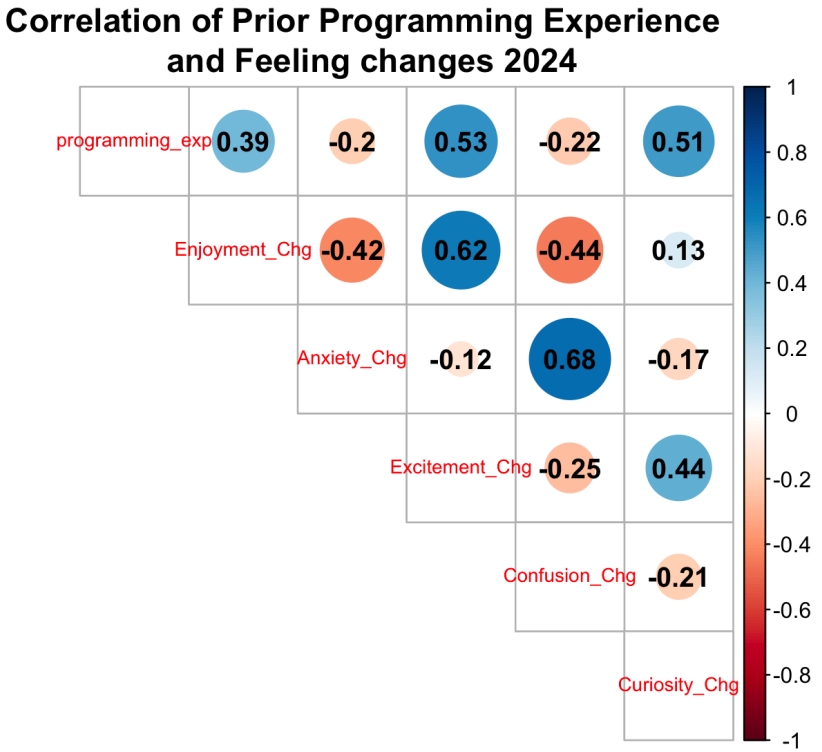
- Correlation of feeling changes from week 1 to week 10 (2023 vs 2024)





Results – Feeling Changes vs Prior Coding Exp





	Enjoyment_Chg	Anxiety_Chg	Excitement_Chg	Confusion_Chg	Curiosity_Chg
programming_exp	-0.590	0.290	-0.590	0.440	-0.360

*p<0.1; **p<0.05; ***p<0.01

	Enjoyment_Chg	Anxiety_Chg	Excitement_Chg	Confusion_Chg	Curiosity_Chg
programming_exp	0.390	-0.200	0.530	-0.220	0.510

*p<0.1; **p<0.05; ***p<0.01

Discussions

- Both attempts at capturing students' feelings during the course have shown that there are some relationships between feeling changes.

- Feeling changes in 2023 and 2024 were similar.

Discussions (cont'd)

- Prior experience of programming was not seen to consistently impact on students' emotional changes.
- We will carry out more observations in alignment with fine-tuning of course settings in the future.
- We will need to address the issues of data collection in the mid-term.

Thank you!
Questions please!