

Reflective Summary

E-Portfolio: <https://kaylie89.github.io/Research-Method/index.html>

# Introduction

This reflection uses Gibbs’ Reflective Cycle (1988) to explore what I learned during the Research Methods and Professional Practice module. The model’s six stages are: Description, feelings, evaluation, analysis, conclusion, and action plan, which helped structure my thinking about key experiences. The module involved statistical analysis, literature review, and proposal writing, each of which challenged me in different ways.

**Description**

The module strengthened my understanding of research through three core areas: a literature review, statistics exercises, and a research proposal. The literature review examined the challenges of state-sponsored cyberterrorism, with a focus on attribution. Since dissertation topics must differ from the literature review, I knew I needed to develop a new area of inquiry that still reflected my broader interest in cybersecurity.

I used Excel’s Analysis ToolPak for statistical tests based on module worksheets.

My proposal focused on adversarial AI in satellite-based nuclear early warning systems. These tasks taught me to move from a general interest to a focused research question. The biggest challenge was not the analysis itself, but finding an original and feasible research gap.

**Feelings**

I initially felt uncertain about the statistics work. I had never used the Analysis ToolPak in Excel, and Unit 8 was especially challenging when trying to choose the correct test. However, the unit guides provided step-by-step support that gradually built my confidence.

In contrast, I felt more comfortable with the literature review. I enjoyed synthesising sources, but I was worried about structure and whether my analysis went deep enough.

Writing the proposal was both exciting and stressful. I appreciated the independence but felt pressure to justify my methodology and address ethics clearly, particularly given the dual-use nature of the topic.

**Evaluation**

The literature review was one of my stronger pieces of work. I identified a research gap and analysed debates around attribution and the definition of cyberterrorism. Some sections were dense, and next time I would improve clarity through better subheadings.

The statistics tasks were more difficult. I completed them, but often struggled to interpret the results. I relied on external guides, which took some time, but were essential to deepening my understanding of the subject.

Developing the proposal helped bring everything together. Explaining the methods took more effort than expected, but planning for ethical risks early made me realise that ethics is central to research credibility and not just a formal requirement.

**Analysis**

One of the most challenging parts of the module was identifying a feasible and original dissertation topic. Since I had already explored cyberterrorism, I needed to take a different direction. It took several weeks to brainstorm ideas that reflected my interests in cybersecurity but had not already been covered in existing research. I struggled to find an artefact idea that did not involve building a technical system, such as coding or simulation. Ultimately, I decided to develop a mitigation framework for addressing adversarial AI threats in critical infrastructure. This idea became central to my proposal and shaped the direction I plan to take in my dissertation. It offered a clear structure and felt both manageable and relevant. Although the proposal could have been based on the literature review, I chose to push myself and use it as an opportunity to begin thinking seriously about the dissertation. The safer option would have been to build on existing work. However, it was more valuable to test out a new topic and begin identifying practical and ethical challenges at an early stage. As I further developed the research question, it became clear that a systematic approach was most suited to the topic. I examined frameworks such as PRISMA and STRIDE to help structure the methodology. This exploration enhanced my understanding of how adversarial AI can be utilised in deception strategies and how such technologies might compromise nuclear early warning systems, potentially increasing the risk of misjudgment or escalation between nuclear-armed states. While the proposal demonstrated solid understanding, it would have benefited from a deeper comparison of threat modelling tools and a discussion of ethical trade-offs in dual-use AI. I plan to develop this further in my dissertation. The lecturecasts explaining different research methods were particularly helpful in clarifying how to align design choices with research aims.

The statistics tasks reshaped how I interpret quantitative research. I no longer see statistics as just a numbers exercise and understand how tests like t-tests and correlations support or challenge assumptions, contributing to more precise, evidence-based conclusions.

Reviewing literature critically also taught me that research gaps are not only about what is missing, but also about what remains unexplored. Gaps are also identified in areas of ambiguity, disagreement, or underexplored issues. This understanding will help me define my dissertation topic more effectively. While developing the project on adversarial AI, I began to think more seriously about the ethical implications of my research. My interests and values shape the way I select research topics, frame questions, and choose methods. This was the first time I had to make these types of decisions independently, as previous assignments were more structured and defined. I established that the way a topic is framed and the methods used to explore it can significantly influence how research connects to real-world challenges.

**Conclusion**

This module has helped me become a more confident and independent researcher. It enhanced my ability to analyse literature, justify methodological decisions, and reflect on ethical considerations. Initially, I felt anxious about statistics, but I have now found it easier to interpret data into meaningful outcomes. Although I will not utilise statistics in my dissertation, the skills I have gained will support my critical engagement with empirical studies.

**Action Plan**

To prepare for my dissertation, I will build on the research gap identified in my proposal by reviewing systematic literature reviews and refining my search strategies and inclusion criteria to maintain focus and relevance.

As I will be using qualitative methods, I plan to explore basic qualitative content analysis as a suitable framework and apply the structured reasoning gained from this module to justify my design choices.

I also aim to deepen my understanding of threat modelling frameworks, particularly their applications in both civilian and military contexts. I will also review literature on ethical challenges in dual-use AI and strengthen my ability to apply critical comparisons, particularly in areas such as mitigation strategies and threat modelling frameworks.

**References List**

Gibbs, G. (1988) *Learning by doing: A guide to teaching and learning methods*. 1st ed. Oxford: Oxford Polytechnic Further Education Unit.