Final Reflective Piece – Research Methods and Professional Practice

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Introduction

This reflective piece critically examines my learning journey throughout the *Research Methods and Professional Practice* module. The module required engagement with the scientific method, ethical and professional responsibilities, qualitative and quantitative methods, statistical reasoning, research writing, and professional development documented through an e-Portfolio. I structure this reflection using Rolfe et al.'s (2001) framework (*What? So What? Now What?*), focusing on: (1) the development of my statistical analysis skills, (2) my understanding of the research methods process, and (3) the impact of this learning on my professional practice. To strengthen transparency and alignment with the assessment brief, I signpost supporting artefacts using evidence codes (E1–E6), which correspond to downloadable links in my e-Portfolio.

WHAT – Description of the learning experience

The module's progression started with scientific investigation and ethics, then covered research design, methods, and data collection, followed by quantitative analysis, inferential statistics, and data visualisation. It ended by emphasising research writing, proposals, reflective development, and risk-aware project thinking.

In early research, exploration, description, and explanation were grounded in the scientific method, including inductive and deductive reasoning. Ethics was essential, requiring diligence, transparency, and accountability in research involving people or sensitive data. This shaped my justification for methodological choices and data handling. Mid-module learning deepened my understanding of how research design aligns with goals. The qualitative focus emphasised depth through case studies and observation, but noted risks such as bias and limited generalisability. Data collection methods (surveys, interviews) highlighted the need for sampling and testing to ensure reliability. The quantitative part (Units 6–8) strengthened skills in summarising data, inferential reasoning, hypothesis testing, and analysis. These skills were applied through assessments that required explanations, not just calculations, as seen in E2 and E3. Later units emphasised validity, reliability, and generalisability, with research communication and proposals as final tasks, supported by understanding risk and change in real projects.

SO WHAT – Critical analysis of learning

1) Statistical analysis skills: from calculation to defensible interpretation

My main development was moving from producing statistical outputs to defending interpretations. Early work focused on generating charts and numbers without consistently questioning meaning, assumptions, or potential misreading. The module corrected this by requiring interpretation in context and explicit justification of choices.

This shift is evident in E2 (Unit 7 Activity: Hypothesis Testing and Summary Measures), which required outcomes to be interpreted based on the questions asked and the data analysis, not solely on computation. Completing E2 strengthened my ability to explain what results support, what they cannot prove, and how uncertainty should be communicated. E3 (Statistical Worksheet: Charts and Analysis, Unit 8) reinforced that visualisations are not neutral and can shape conclusions; I became more attentive to how presentation may exaggerate or mask meaning, which is directly relevant to professional reporting using dashboards and KPIs.

Finally, linking statistics to research quality (validity, reliability, generalisability) made me more cautious about the strength and limits of conclusions. I now treat statistical outputs as evidence within arguments that must include assumptions and limitations, thereby improving both academic criticality and professional credibility.

2) Understanding the research methods process: coherence, ethics, and alignment

My second major development was understanding research as a coherent system: research question → design → method → data collection → analysis → interpretation → reporting. I initially underestimated the difficulty of aligning a question with an appropriate and feasible method, because this requires judgment about what counts as evidence and how quality is protected.

This learning is evidenced through progression across artefacts. E4 (Literature Review Outline) shows my shift from collecting sources to synthesising literature, strategically organising evidence by what is known, what is contested, and where a gap justifies further research. E5 (Research Proposal Review) strengthened my ability to evaluate research through a methodological lens, focusing on coherence and fit among aims, methods, and analysis, and on identifying where claims exceed evidence. E6 (Research Proposal Presentation) required concise communication of research logic; it reinforced that research quality includes how clearly decisions can be justified to others, which is essential in computing contexts involving stakeholders and constraints.

Ethics and professionalism also became more concrete: I now recognise that ethical thinking must be embedded in planning, as methodological choices can pose risks to participants, organisations, and data integrity.

3) Personal and professional development through reflective practice

The e-Portfolio approach strengthened my independent learning by making my thinking visible and linking reflection directly to artefacts. This is most clearly evidenced in E1 (Discussion Forum 1), which required synthesis and response rather than passive participation, helping me develop clearer justification, engagement with alternative viewpoints, and reflective reasoning.

Although unfamiliar statistical concepts initially created uncertainty, structured reflection helped me treat difficulty as a learning signal. Over time, repeated practice (E2/E3), peer engagement (E1), and explicit quality concepts (validity/reliability) strengthened my confidence and resilience, which support professional problem-solving in ambiguous situations.

NOW WHAT – Impact on professional practice

The module's learning outcomes translate directly into professional computing and information systems work. First, improved statistical literacy supports evidence-based decision-making: I can interpret outputs critically, communicate limitations, and avoid overconfident claims (E2, E3). Second, the research design mindset improves how I approach complex problems: I am more likely to define the question clearly, select appropriate evidence sources, and justify decisions using method-quality reasoning (E4–E6). Third, I now integrate risk-awareness into planning: research and projects are shaped by uncertainty and change, and robust practice requires anticipating impacts rather than reacting late.

Practically, I will apply this learning by: (1) attaching a short "validity and limitations" statement to analyses or dashboard recommendations; (2) using a mini research cycle (question → method → evidence → interpretation) before recommending solutions; and (3) maintaining reflective review after key decisions to support continuous professional development.

Conclusion

Overall, the module strengthened my ability to think and act as a reflective, evidence-led computing practitioner. My progress is evidenced through my e-Portfolio artefacts (E1–E6), which demonstrate development across statistical reasoning, alignment with research design, critical evaluation, ethical awareness, communication, and reflective professionalism. By using evidence purposefully, linking each learning claim to concrete assessed work, this reflection shows not only what I learned but also how it is demonstrated and why it matters for my future practice.

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Evidence Index (e-Portfolio downloadable links)

- **E1** – Discussion Forum 1 (Unit 1)
- **E2** – Unit 7 Activity: Hypothesis Testing and Summary Measures
- **E3** – Statistical Worksheet: Charts and Analysis (Unit 8)
- **E4** – Literature Review Outline (Unit 4 formative submission)
- **E5** – Research Proposal Review (Unit 3 peer review activity)
- **E6** – Research Proposal Presentation (Unit 10)