

Professional Skills Reflection and Development Plan

The Research Methods module has significantly enhanced my understanding of academic research and helped me feel prepared to undertake a dissertation for the first time. As my undergraduate degree did not include a dissertation component, this module filled important gaps in my knowledge and provided a clear structure for approaching independent research (Wong et al., 2021).

Professional Skills Matrix

The module supported the development of a broad range of academic and professional skills aligned with the BCS guidelines for computing postgraduates and the Essex Graduate Capabilities Framework (BCS, 2022; Wong et al., 2021). One area of growth was research design: I gained a clearer understanding of qualitative, quantitative, and mixed methods approaches and developed confidence in selecting appropriate methodologies (Creswell & Creswell, 2018). This was reinforced through practical activities, particularly the proposal draft, which required justification of methodological choices.

Using the SMART framework (Doran, 1981), I improved my ability to define focused research questions and align them with achievable objectives—skills I intend to apply in professional settings as well. I also made progress in literature analysis, shifting from descriptive summaries to critical comparison and evaluation, which are key to higher-level academic work (Booth, Sutton & Papaioannou, 2016). However, I aim to improve my ability to synthesise arguments under time pressure.

The module placed strong emphasis on research ethics, including informed consent, confidentiality, and researcher responsibility—principles grounded in research ethics frameworks like the Menlo Report (Finn & Shilton, 2023). This heightened my awareness of ethical practice both academically and professionally.

Quantitative analysis was initially challenging, but through Excel tasks and hypothesis testing exercises, I gained confidence in interpreting data and using measures such as means, standard deviations, and p-values (Field, 2018). I applied these skills in my workplace, analysing railway track failure data, which confirmed their real-world utility.

Lastly, the module strengthened my reflective thinking skills. Using Gibbs' (1988) reflective cycle helped me understand how structured reflection can guide better decision-making in both learning and work contexts.

SWOT Analysis

Strengths

- The module improved overall research literacy, giving me a stronger sense of structure when planning analytical tasks.
- Applying statistical understanding at work (e.g. analysing railway track failures) helped reinforce core concepts in a non-academic environment.
- I feel more comfortable discussing methodological choices, which increases my confidence ahead of writing a full dissertation.

Weaknesses

- I lack experience with carrying out primary research in real conditions, such as conducting interviews or distributing surveys.
- While I can apply basic statistical techniques, I remain hesitant when faced with advanced analysis or interpreting subtle results.
- The absence of a dissertation during my undergraduate studies means I am only now developing long-form academic research skills.

Opportunities

- My current work responsibilities involve operational analytics, which offers a perfect environment to test and grow the skills acquired during the module.
- The dissertation project presents an opportunity to design and deliver an entire research process for the first time.
- Access to academic resources and tutor feedback can help refine areas I find less intuitive, especially reflective writing and methodology articulation.

Threats

- Balancing the demands of work, dissertation, and self-directed learning may create time management challenges.
- Without regular use, some of the more technical skills (e.g. hypothesis testing or data visualisation) could fade.
- Overreliance on Excel might limit my ability to engage with more advanced or industry-standard analytical tools if needed.

Action Plan

Strengthen Primary Research Design for AI Contexts

- Action: Draft a survey or interview guide tailored to AI adoption, perception, or ethical use in a professional setting.
- When: By mid-August 2025
- Why: To build experience applying research tools to contemporary, real-world topics relevant to your dissertation.
- Resources: Review qualitative methods materials; consult academic literature on AI in society; get feedback from tutor.

Deepen Understanding of Quantitative Analysis in AI Research

- Action: Practise hypothesis testing and basic modelling using openly available AI datasets (e.g. public sentiment on ChatGPT or automation impact).
- When: Weekly sessions through September
- Why: To sharpen analytical skills in preparation for your own AI-related data analysis.
- Resources: UCI Machine Learning Repository, Kaggle datasets, previous coursework templates.

Refine Data Visualisation and Interpretation Skills in R

- Action: Apply R to explore and visualise AI-related datasets (e.g. algorithm outputs, survey responses on AI adoption) using ggplot2, tidyverse, or shiny.

- When: Bi-weekly practice sessions from August to November 2025
- Why: To maintain and enhance fluency in R by using it for real datasets that align with your dissertation, ensuring your analysis is both rigorous and presentation-ready.
- Resources: RStudio tutorials, Tidy Tuesday datasets, or AI-related data from Kaggle or academic repositories.

References:

BCS (2022). *BCS Code of Conduct*. British Computer Society. Available at:

<https://www.bcs.org/membership/become-a-member/bcs-code-of-conduct/>

(Accessed 13 July 2025).

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic Approaches to a Successful Literature Review* (2nd ed.). London: Sage.

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Thousand Oaks, CA: Sage.

Doran, G. T. (1981). There's a S.M.A.R.T. way to write management's goals and objectives. *Management Review*, 70(11), 35–36.

Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics* (5th ed.). London: Sage.

Finn, M., & Shilton, K. (2023). Ethics governance development: The case of the Menlo Report. *Social Studies of Science*, 53(3), 315–340.

Gibbs, G. (1988). *Learning by Doing: A Guide to Teaching and Learning Methods*. Oxford: Oxford Polytechnic.

Wong, B., Chiu, Y.-T. T., Copsey-Blake, M. & Nikolopoulou, M., (2021). *A mapping of graduate attributes: what can we expect from UK university students?* Higher Education Research & Development, 41(4), pp. 1–16. Available at: https://www.researchgate.net/publication/349420700_A_mapping_of_graduate_attributes_what_can_we_expect_from_UK_university_students (Accessed 13 July 2025).