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Assessment Task 4 – ePortfolio (Option 1)

KIT714 ICT Research Principles

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1. Introduction

This ePortfolio documents my progression through KIT714 - ICT Research Principles, demonstrating how I developed an integrated research mindset across qualitative inquiry, quantitative analysis, and scholarly synthesis. At the start of the unit, I viewed methods as discrete techniques. Through lectures, tutorials, and three scaffolded assessments, I came to understand research as a systematic, ethical, and reflective process: define a tractable question; align worldview, strategy, and method; collect and analyse data transparently; interpret with attention to uncertainty; and communicate decision-relevant implications.

The unit's assessments were pivotal. Assessment 1 cultivated interpretive reasoning and qualitative rigour through interviewing, coding, and theming. Assessment 2 strengthened statistical competence with assumption testing, effect sizes, and directional hypotheses that link analysis to practice. Assessment 3 consolidated critical reading and synthesis, culminating in a defensible ICT research gap. Collectively, these experiences aligned with the Intended Learning Outcomes (ILOs): (1) producing credible research artefacts, (2) applying appropriate methodologies ethically, and (3) evaluating and communicating research skills for professional ICT contexts.

This report explains what I learned, when and how that learning occurred, and why it matters for future study and ICT practice, including cybersecurity, analytics, user centred design, and responsible AI. It also provides a critical reflection on successes and barriers encountered during the semester.

This ePortfolio also marks my transition from learning research procedures to developing a researcher identity someone who questions ethically, analyses critically, and communicates evidence responsibly. Through this journey, I have learned to connect theoretical understanding, technical analysis, and reflective judgement to make decisions that are both data-driven and ethically informed.

2. Knowledge and Process

2.1 Qualitative Research

Weeks 2–4 introduced qualitative research as an interpretive approach grounded in constructivist and phenomenological worldviews. Rather than quantifying behaviour, qualitative inquiry seeks to understand meaning in context. Lectures differentiated strategies case study, ethnography, action research, phenomenology, grounded theory from methods such as interviews, focus groups, and observation, emphasising that method must flow from research purpose and philosophical stance. Tutorials highlighted researcher positionality, rapport, and ethical obligations (consent, confidentiality, and harm minimisation) that shape data quality.

For Assessment 1, I explored students' experiences with Generative AI in learning. A phenomenological lens was appropriate because the aim was to surface lived experience rather than test causal hypotheses. I designed semi-structured interviews around perceived usefulness, originality, trust, and academic integrity. This format provided enough structure to support comparability while leaving space for unexpected insights.

I analysed transcripts using open coding (many small labels) followed by focused coding (collapsing related codes). Recurring ideas curiosity, productivity gain, fear of misuse, loss of originality, peer influence resolved into two themes aligned to Braun and Clarke's framework:

Motivation with guardrails: enthusiasm for faster ideation balanced by a desire for clear policy boundaries and tutor guidance.

Ambivalence about authorship: appreciation for assistance counterweighted by concern about voice, originality, and overreliance.

To enhance trustworthiness, I applied Lincoln and Guba's criteria: credibility (constant comparison and code quote checks), transferability (thick description of course context), dependability (an audit trail of coding merges/splits), and confirmability (reflexive notes acknowledging my positive predisposition toward AI). Purposive heterogeneity (discipline, study stage, prior AI exposure) supported conceptual breadth. I also identified triangulation opportunities brief observational notes or usage diaries to mitigate self-report bias.

What/When/How evidence. This learning occurred in Weeks 3-4 via interview practice, coding tutorials, and AT1 drafting with peer debriefs. These activities operationalised phenomenology (lived meaning, perceived agency) and demonstrated why interviews not surveys were most appropriate for capturing the tension between excitement and worry.

This stage reinforced that qualitative design depends on theoretical alignment each question, participant, and coding choice must connect to the worldview guiding the study. I learned that reflexivity is a methodological safeguard, ensuring credibility, ethical integrity, and transparent interpretation of meaning.

2.2 Quantitative Research

Weeks 5–8 reoriented my thinking toward positivist traditions emphasising measurement, reliability, and replication. I learned that validity begins at the design stage: clear operational definitions, reliable measures, adequate power, and an analysis plan aligned to assumptions. Tutorials contrasted parametric and non-parametric tests, stressed diagnostic checking, and modelled ethical reporting beyond binary p-values.

For Assessment 2, I examined whether three teaching methods (A, B, C) led to different learning outcomes and which factors predicted performance. Using JASP, I:

summarised distributions (means, SDs; boxplots for spread/outliers);

checked assumptions Shapiro-Wilk and Q-Q plots for normality, Levene's test for homogeneity;

ran a one-way ANOVA (Method → Score);

used Tukey post hoc tests; and

fitted a multiple regression with predictors: pre-test score, instructor experience, study time, and delivery mode.

Results. ANOVA indicated a significant method effect, $F(2, 57) = 6.13$, $p = .0039$; Method C outperformed A and B. Reporting $\eta^2 = 0.18$ communicated a moderate, practically meaningful effect. Post hoc comparisons confirmed C > A and C > B. The regression (Adj $R^2 = .47$, $p < .001$) showed pre-test competency and instructor experience as strong positive predictors, with online delivery showing a small negative association. Diagnostics confirmed linearity, homoscedasticity, and multicollinearity within acceptable limits (VIF < 5).

Beyond p-values, I reported confidence intervals and standardised coefficients to support magnitude reasoning. I documented non-parametric alternatives (Kruskal Wallis; rank-based comparisons) if assumptions failed and reflected on power: with N ≈ 60, the design could detect moderate effects, while subtle effects might remain undetected.

Feedback recommended directional hypotheses grounded in descriptives and clearer practical significance. I revised to: "H_1: Method C will yield higher scores than A and B due to interactive, feedback-rich activities," and

explained that a five point improvement can shift borderline students above critical thresholds, which matters for progression and resource allocation.

What/When/How evidence. This learning occurred in Weeks 6–8 through JASP labs and AT2 feedback sessions that emphasised assumption checks, effect sizes, interval reporting, and decision useful interpretation ethical statistics that avoid overclaiming.

These experiences showed that statistical analysis is also an act of ethical reasoning under uncertainty. Understanding assumptions, power, and effect sizes transforms statistics from mechanical computation into responsible decision making, a vital capability for data driven ICT research and reporting.

2.3 Literature Review and Synthesis

Weeks 9–12 emphasised critical thinking and synthesis. A literature review is not a catalogue of results; it constructs an argument by integrating, contrasting, and evaluating methods, contexts, and findings to reveal patterns, tensions, and gaps.

For Assessment 3, our group reviewed AI in healthcare across diagnostics, predictive analytics, and personalised treatment. Using the unit's Reviewing Literature and Synthesis templates, we examined each study's problem framing, datasets, algorithms, evaluation metrics, and limitations (sampling bias, external validity, explainability, governance).

Three insights converged. First, accuracy alone is insufficient: clinician adoption depends on explainability, auditability, and workflow fit. Second, data lineage and governance are crucial; without clear provenance and curation, models risk bias and poor generalisability. Third, socio-technical alignment matters: interfaces, oversight roles, and accountability structures shape whether clinicians will rely on AI in high-stakes contexts.

Synthesising these strands, we argued that the central barrier is not algorithmic capability but trust a socio-technical construct requiring transparent design, governance, and post-deployment monitoring. Accordingly, the research gap we articulated focused on trust and transparency rather than "make accuracy higher."

What/When/How evidence. This learning occurred in Weeks 9–12 through guided synthesis workshops, structured peer reviews, and the AT3 drafting cycle. The process moved my work from descriptive summary to integrated argument, connecting accuracy, explainability, data lineage, and socio-technical fit to a coherent, actionable gap statement.

From this synthesis I recognised that genuine knowledge construction arises when evidence is integrated to reveal gaps that advance both theory and practice. Evaluating literature for quality, bias, and transferability shifted my mindset from summary to critique, strengthening my ability to conduct and apply research strategically.

3. Reflection

Across the semester, I shifted from procedural execution to reflective, principled inquiry. I now treat research as a cycle: formulate a focused question; align worldview, strategy, and method; gather and analyse data; check assumptions and bias; interpret cautiously; and communicate with transparency.

Successes.

Multi-method fluency: qualitative interviewing and theming; hypothesis testing and regression; literature synthesis that advances an argument rather than merely summarising.

Communication: clearer research questions, stronger method justifications, labelled visuals, and concise interpretation linked explicitly to audience needs.

Collaboration: constructive peer feedback, shared reference management, and harmonising multiple voices into a coherent report.

Barriers and resolutions.

- Method theory alignment: early drafts treated methods as detachable tools. Revisiting design logic (worldview → strategy → method) made justifications coherent and defensible.
- From description to explanation: initial qualitative coding listed categories without mechanisms. Analytic memoing during coding captured emerging "why" ideas and refined themes with theoretical depth.
- Overreliance on p-values: adopting estimation thinking (effect sizes and confidence intervals) reframed analysis toward decision-useful meaning and tempered binary interpretations.

Metacognitive growth. A weekly methods log recorded decisions, rationale, and alternatives, creating an audit trail that prevented "black-box" reasoning. A plain-English-first drafting rule ensured every result had a clear interpretation before technical phrasing, improving accessibility for mixed audiences.

ILO linkage. These reflections directly advanced ILO-2 (apply appropriate methodologies ethically) by strengthening alignment between design and worldview, and ILO-3 (evaluate and communicate research skills

for ICT practice) through transparent, audience-appropriate reporting of uncertainty, limitations, and practical significance.

Collectively, these reflections demonstrate my progression from procedural competence to professional research maturity. I now regard research as an ongoing practice of ethical judgement and creative problem-solving rather than compliance with instruction. This transformation directly supports ILO-2 (ethical methodology) and ILO-3 (critical communication of research), evidencing growth into a reflective practitioner researcher.

4. Application to ICT Practice

The capabilities developed in KIT714 translate directly to professional ICT contexts where rigour, clarity, and ethics are essential.

A. Mixed-methods UX for secure onboarding.

Improving multi-factor authentication (MFA) benefits from qualitative and quantitative integration. Begin with interviews to surface trust barriers (device-loss anxiety, OTP friction, SIM-swap fears) and context of use. Translate insights into directional hypotheses for an A/B experiment (e.g., app-based push vs SMS OTP) measuring completion time, error rate, and abandonment. Thematic explanations (why users fail) plus statistical estimates (how much each design helps) produce evidence-based decisions for product teams and security architects.

B. Analytics for security awareness and risk.

To evaluate a phishing awareness program, implement pre/post regression modelling click through reduction by training exposure, delivery mode, and prior incidents. If assumptions are violated, use non-parametric tests or robust estimators. Complement logs with focus groups to capture cultural pressures (e.g., urgency norms) that quantitative traces miss. Report effect sizes and confidence intervals and provide a clear implications section translating results into policy actions.

C. Responsible AI in operations.

Drawing on the healthcare synthesis, deploy AI classifiers (e.g., anomaly detection) with model cards (purpose, data limits, risks), data-lineage documentation, and human-in-the-loop review for high-impact decisions. Maintain a risk register (bias, drift, false-positive cost) and monitoring dashboards (precision/recall, time-to-resolution). Stakeholder workshops on trust, explainability, and escalation align technical precision with organisational accountability.

Transferability statement. Collectively, these cases demonstrate how qualitative empathy, quantitative rigour, and integrative synthesis combine to produce evidence-based, ethical, and user-centred ICT solutions. They also form a repeatable blueprint for future study and practice: frame the question; select defensible methods; analyse transparently; report with integrity; and implement with governance.

Integrating qualitative, quantitative, and synthesis skills enables evidence-based ICT innovation. Whether improving cybersecurity training, assessing usability, or deploying ethical AI, these research frameworks ensure transparency, reproducibility, and accountability. This blended capability also enhances readiness for professional roles that demand analytical rigour, policy awareness, and ethical governance.

5. Conclusion

This ePortfolio records my progression from applying techniques in isolation to thinking and acting like a researcher. Qualitative inquiry cultivated sensitivity to meaning and context; quantitative analysis developed precision, assumption awareness, and estimation-based reasoning; literature synthesis fostered critical integration and ethical foresight. The unifying insight is that credible ICT research rests on clarity of purpose, methodological integrity, transparent analysis, and reflective application.

I now approach academic and professional challenges as iterative cycles of inquiry ask a focused question; align worldview, design, and method; analyse openly; and communicate implications with humility about uncertainty. These habits will guide my contribution to secure, ethical, and user-centred ICT solutions. Whether designing secure onboarding, evaluating awareness programs, or deploying AI responsibly, I will combine mixed methods, ethical guardrails, and evidence synthesis to ensure outcomes are not only effective but also trusted and sustainable. I will maintain a continuous synthesis habit, regularly scanning new research and updating practice to stay aligned with emerging evidence and standards.

KIT714 has therefore shaped me into a reflective practitioner-researcher who connects theory, data, and ethics in practice. This growth demonstrates academic mastery and readiness to contribute to real-world ICT projects where evidence-based reasoning and ethical awareness underpin organisational trust and innovation.

6. References

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