

## Unit 4 Project methodology

Field: Social engineering (Phishing)

Approaches:

Empirical research:

Observing behaviours and recording observations from a simulation experiment.

Identify the current approaches to phishing from the literature review and design the simulation from this. Data collection would occur from the simulation to record actions and behaviours (Wheelan, 2013).

Statistical report information/data and further literature review.

Mixed method:

Survey (Qualitative and quantitative) (Dawson, 2009) – Prior to simulation to assess user perceived cybersecurity awareness. Use of Google form/survey monkey.

Action research:

Web-based application simulation providing users with the option to make decisions on whether the example is a phishing or non-phishing attempt. Record the data in terms of these features:

- Decision response
- Justification for decision
- Confidence level of decision
- Time taken to make the decision

Independent variable: Phishing attempt

Dependent variable: Decision made through cyber awareness

Hypothesis – Secondary school students have cyber awareness and can use techniques to mitigate phishing attempts.

Explore:

Potentially produce a decision tree model (Navlani, 2023) in Python (Bowne-Anderson, 2018).

Use the data in a machine learning decision tree model with training and testing data for predictions. Using the available datasets (Tiwari, 2021) for training and student-collected data for testing.

Ethical considerations:

Vulnerable groups-Students

Parental/Guardian consent is needed for surveys and participation in the simulation.

(Roberts & Allen, 2015)

Database will be needed, so further consent is needed (Dawson, 2009).

## References

Bowne-Anderson, H. (2018). Kaggle Tutorial: Your First Machine Learning Model. Available from: <https://www.datacamp.com/tutorial/kaggle-tutorial-machine-learning> [Accessed 28 May 2023].

Dawson, C. W. (2009). *Projects in Computing and Information Systems: A Student's Guide*. Pearson Prentice Hall.

Navlani, A. (2023). Decision Tree Classification in Python Tutorial. Available from: <https://www.datacamp.com/tutorial/decision-tree-classification-python> [Accessed 28 May 2023].

Roberts, L. D. & Allen, P. J. (2015). Exploring ethical issues associated with using online surveys in educational research. *Educational Research and Evaluation*, 21, (2): 95-108.

Tiwari, S. (2021). Phishing Dataset for Machine Learning. Available from: <https://www.kaggle.com/datasets/shashwatwork/phishing-dataset-for-machine-learning> [Accessed 28 May 2023].

Wheelan, J. (2013). *Naked Statistics: Stripping the Dread from the Data*. New York, W.W. Norton.