



University of Essex

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Online

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# Research Methods and Professional Practice

## Seminar 2

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BSc, MSc, CIMA Cert BA, PhD, FHEA



## About the module

**On completion of this module, students will be able to:**

- Appraise the professional, legal, social, cultural and ethical issues that affect computing professionals.
- Appraise the principles of academic investigation, applying them to a research topic in the applicable computing field.
- Evaluate critically existing literature, research design and methodology for the chosen topic, including data analysis processes.
- Produce and evaluate critically a research proposal for the chosen topic.



## Module Overview

- Unit 1: Introduction to Research Methods. The Scientific Investigation and Ethics in Computing
- Unit 2: Research Questions, the Literature Review and the Research Proposal
- Unit 3: Methodology and Research Methods
- Unit 4: Case Studies, Focus Groups and Observations
- Unit 5: Interviews, Survey Methods, and Questionnaire Design
- Unit 6: Quantitative Methods - Descriptive and Inferential Statistics
- Unit 7: Inferential Statistics and Hypothesis Testing
- Unit 8: Data Analysis and Visualisation
- Unit 9: Validity and Generalisability in Research
- Unit 10: Research Writing
- Unit 11: Going Forward: Professional Development and Your e-Portfolio
- Unit 12: Project Management and Managing Risk



# Seminars

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3.	<a href="#"><u>Peer Review Activity</u></a>
4.	<a href="#"><u>Case Study on Privacy</u></a>
7.	<a href="#"><u>Inferential Statistics Workshop</u></a>
8.	<a href="#"><u>Workshop on Presenting Results</u></a>
11.	<a href="#"><u>e-Portfolio Preparation</u></a>



## Deadline details

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# Assessment

Assessment	Length/duration	Submission	Weighting
<u>Literature Review</u>	2,000 words	By end of Unit 7	30%
<u>Research Proposal Presentation</u>	15 Minute presentation and transcript	By end of Unit 10	30%
<u>End of Module Assignment: e-Portfolio</u>	2,500 words equivalent including 1,000 word reflective piece	By end of Unit 12	40%



# Main e-portfolio and formative activities

Unit(s)	Component	Deadline	e-Portfolio/Formative
1 - 3	Collaborative Discussion 1	End of unit 3	e-Portfolio
1	Reasoning Quiz	End of unit 1	Formative
1	Reflective Activity 1: Ethics in Computing	End of unit 1	e-Portfolio/Formative
2	e-Portfolio Activity: Literature Review and Research Proposal Outlines	End of unit 4	e-Portfolio/Formative
3	e-Portfolio Activity: Research Proposal Review	End of unit 3	e-Portfolio/Formative
3	Seminar 2: Peer Review Activity	End of unit 3	Formative
4	Seminar 3: Case Study on Privacy	End of unit 4	Formative
4	Literature Review Outline Submission	End of unit 4	Formative
5	Reflective Activity 2: Case Study: Inappropriate Use of Surveys	End of unit 5	Formative
5	Wiki Activity: Questionnaires	End of unit 5	Formative
7 - 9	Collaborative Discussion 2: Case Study on Accuracy of Information	End of unit 9	e-Portfolio
7	Seminar 4: Inferential Statistics Workshop and Statistics Worksheet	End of unit 7	Formative/e-Portfolio (worksheets)
8	e-Portfolio Activity: Research Proposal Outline	End of unit 8	e-Portfolio/Formative
8 - 9	Statistical Worksheet Submissions	End of unit 10	e-Portfolio (compulsory)
9	e-Portfolio Activity: Charis Example Worksheet	End of unit 9	e-Portfolio/Formative
11	Seminar 6: e-Portfolio Preparation	End of unit 11	e-Portfolio/Formative
12	Self Test Quiz	End of unit 12	Formative



# Unit 1: Introduction to Research Methods. The Scientific Investigation and Ethics in Computing

## e-Portfolio Assessment and Formative Activities | 8 hrs

**Complete** the compulsory e-Portfolio reflective component.

**Participate** in the introductory seminar for this module.

**Complete** the reasoning quiz and the reflective activity.



**e-Portfolio Activity: Reflective Activity 1 – Ethics in Computing in the age of Generative AI**



**e-Portfolio Activity: Collaborative Learning Discussion 1**



**Share your e-Portfolio**



**Reasoning Quiz**





# Unit 3: Methodology and Research Methods

## Unit 3 Seminar - Title: Peer Review Activity

- In this seminar, we will be focusing on LO 3: “Evaluate critically existing literature, research design and methodology for the chosen topic.” One way this is done is by conducting a peer review of existing literature on a particular subject.
- In preparation for this week’s seminar, you will need to source at least 2 papers in a Computing subject of your choice (AI, Cybersecurity, Data Science, or a general interest topic in Computer Science) provided they utilise two different types of research methods to achieve their goal/research aims. Now answer the following questions (please provide justifications for your answers) and be prepared to discuss them in the session:
  - Familiarise yourself with the purpose, problem, objective or research question of each paper. Are they in line with your experience or thoughts on the topic, contributing to the collective body of knowledge in this area?
  - Is the research methodology utilised in each paper appropriate for the stated purpose or question?
  - In terms of data collection and analysis, is this also appropriate for the stated purpose or question? (We will discuss this further in upcoming units.)
  - Does each paper support its claims and conclusions with explicit arguments or evidence?
  - How would you enhance the work/paper?
- You can set up your responses as a presentation for the group. Remember to record your answers and feedback in your e-portfolio.
- **Prepare** for next week's seminar session by attempting the preparation questions, available in unit 4.



# Unit 3: Methodology and Research Methods

## There Are Two Types of Research Design:

- **Exploratory Research:** where, as the name suggests, specific aspects of a research area are explored.
- **Conclusive Research:** being the opposite of exploratory research, the focus is more specific – to verify insights and aid in selecting a course of action (BRM, n.d.).

## Research Methods

- **Qualitative Research**
- **The Tools and Techniques Used to Gather Qualitative Research Data Are:**
  - Focus groups (Covered in unit 4).
  - Case studies (Covered in unit 4).
  - Observations (Covered in unit 4).
  - Surveys/Questionnaires (Covered in unit 5).
  - Interviews (Covered in unit 5).
- **Quantitative Research:** refers to a research method used to gather numerical data to which statistical analysis can be applied. It focuses on discovering patterns and/or relationships and can therefore be used to make generalisations. So, the main questions being explored using this method are “how much?”, “how many?” and “to what extent?”. Deductive approaches are associated with quantitative research.
- The tools and techniques used to gather quantitative research data are a few, some in common with qualitative methods (surveys, case studies), others more typical of quantitative methods (design of experiments, IoT/sensor/ satellite data, big data, etc).
- **Mixed Methods Research:** integrates both qualitative and quantitative research to provide a holistic approach to a research project.
- Conducting research based on any research method involves 2 methods for data collection:
  - Primary research, where information is gathered directly from the subject using.
  - Secondary research, where data is gathered from previously published primary research, like published case studies and articles, magazines, newspapers, books, etc.



## Unit 3: Methodology and Research Methods

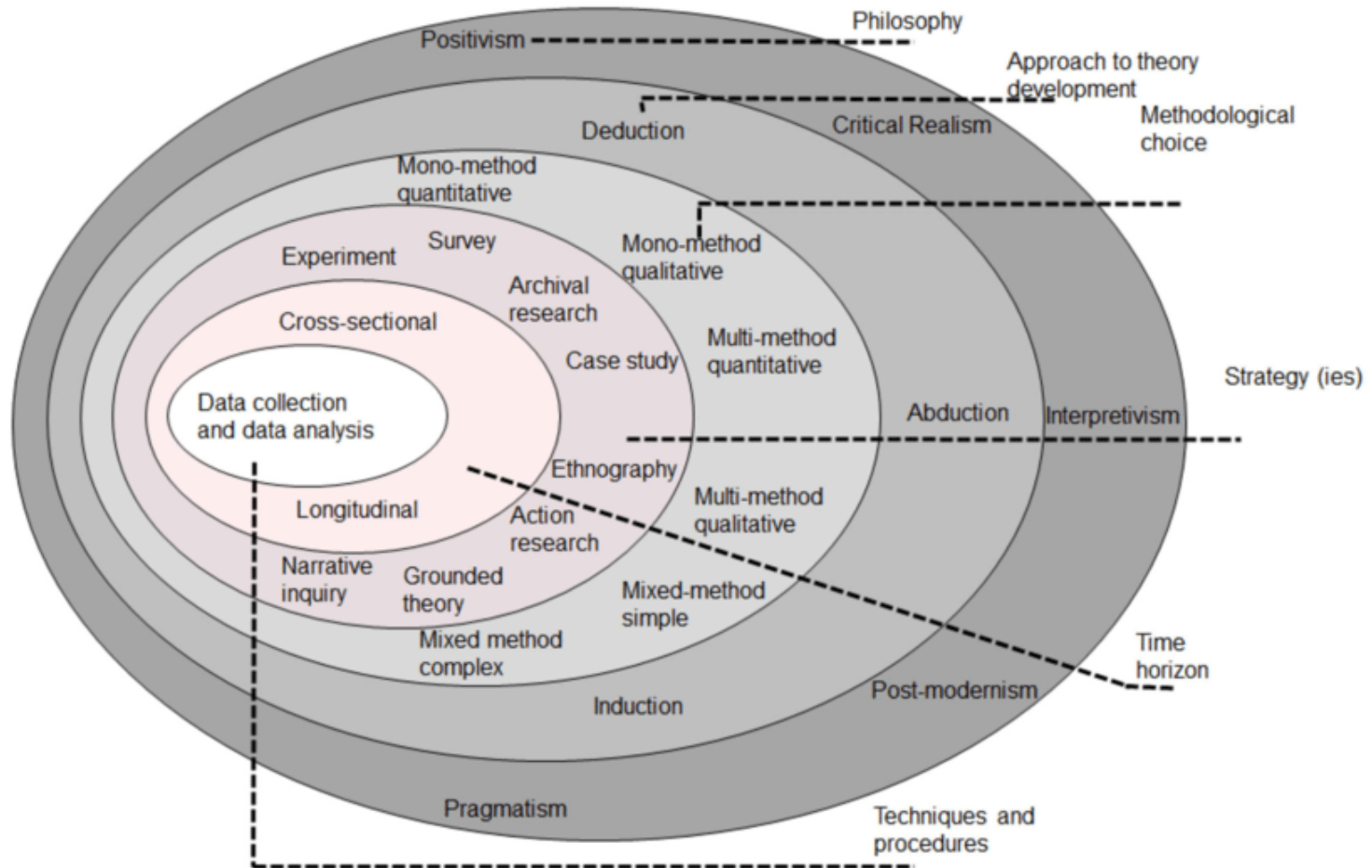
Considering your thoughts on your chosen area of interest for your project:

- Which of the methods described in this week's reading would you think would suit your purpose?
- Which data collection methods would you consider using?
- Which required skills will you need to have or develop for the chosen project?

Note that you may find that you could be using a mixture of both the research methods and the data collection methods. These considerations will be included in your presentation of the Project Proposal in unit 10.



## Unit 3: Methodology and Research Methods





## Unit 4: Case Studies, Focus Groups and Observations

### Case Studies

- These involve in-depth research and study of individuals or groups. Case studies lead to a hypothesis and widen a further scope of studying a phenomenon.
- However, case studies should not be used to determine cause and effect as they cannot make accurate predictions (due to possible bias on the researcher's part). The other reason why case studies are not a reliable way of conducting descriptive research is that there could be an atypical respondent in the survey. Describing them leads to weak generalisations and a move away from external validity (see unit 7).

### Focus Groups

- Focus groups are also one of the commonly used qualitative research methods used in data collection. In such a method, a group of people is chosen and allowed to express their insights on the topic that is being studied.
- It is important to make sure that when choosing the individuals for a focus group (limited to 6-10 people), they should have a common background, comparable experiences, and are representative of your target market. The main aim of the focus group is to find answers to the "why" "what" and "how" questions, then to reach out to those individuals.
- It is important to realise that some of this data collection methods can be also used for quantitative research.

### Quantitative Observation

- This refers to observing numerical values such as weight, volume, shape, usually from a sample that represents the researcher's target market/goal. So, there is an objective collection of data and then statistical and numerical analysis methods are applied to the data to obtain research results. Quantitative observation can be carried via experimentation or surveys (for example, customer satisfaction surveys).

### Qualitative Observation

- This refers to the monitoring of characteristics. In this case, the researcher observes the predetermined respondents from a distance. In this data gathering method, the respondents should be in a comfortable environment to help ensure that the characteristics observed are natural and effective. For example, a researcher in a supermarket can, from afar, monitor and track the customers' selection and purchasing trends. This offers a more in-depth insight into the purchasing experience of the customer. In a descriptive research design, the researcher can choose to be either a complete observer, an observer as a participant, a participant as an observer, or a full participant.



# Unit 4: Reminder Formative Literature Review

## Formative Activities | 11 hrs

**Participate** in the seminar this week.

**Remember** to record your ideas and feedback in your e-Portfolio.

**Submit** a brief outline of your literature review this week. You will receive formative feedback on this submission to aid your final submission which is due in Unit 7.

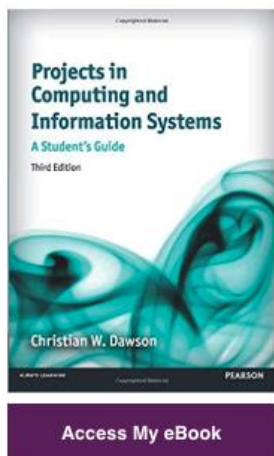


Literature Review Outline

Make a submission

- Please complete the Literature Review on a word document and consider academically appropriate professional presentation when completing this, for example:
- Putting your name, student number, where you are studying, the module your are studying on a title page and the unit you are responding to
- Use Arial font size 12
- Double line spacing
- Margin indentations should be approx. 2.5cm on either side
- Use regular citation
- Apply a list of references at the end of your Literature Review
- Ensure paragraphs are evenly weighted
- Ensure that syntax is academic and concise [use word count wisely]
- Take a critical approach to content [don't be overly descriptive or subjective in your opinion]
- Ensure that all research is paraphrased away from the original source – consider Turnitin content matches

# eBooks



## Projects in Computing and Information Systems: A Students Guide

**Edition:** 3rd

**Author(s):** Dawson, C.

**Date of Publication:** 2015

**Publisher:** Pearson

**Place of Publication:** Harlow

[Access My eBook](#)



## Basic Business Statistics: Concepts and Applications

**Edition:** 14th

**Author(s):** Berenson, L., Levine, D., Szabat, K. & Stephan, D.F.

**Date of Publication:** 2020

**Publisher:** Pearson

**Place of Publication:** Harlow

**Access via the University of Essex Library.**

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Thank you

Any questions?

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