Unit 16: Computing Research Project (Pearson Set)

Unit code	**K/618/7425**
Unit type	**Core**
Unit level	**5**
Credit value	**30**

Introduction

This unit is assessed through a Pearson-set assignment. Students will choose their own project based on a theme provided by Pearson (this will change annually). The project must be related to their specialist pathway of study (unless the student is studying the general computing pathway). This will enable students to explore and examine a relevant and current topical aspect of computing in the context of a business environment and their chosen specialist pathway.

The aim of this unit is to give students the opportunity to engage in sustained research in a specific field of study. Students will be able to demonstrate the capacity and ability to identify a research theme, to develop research aims, objectives and outcomes, and to present the outcomes of such research in both written and verbal formats. Students are encouraged to reflect on their engagement in the research process, during which recommendations for personal development are key learning points.

On successful completion of this unit, students will have the confidence to engage in problem-solving and research activities. Students will have fundamental knowledge and skills that will enable them to investigate workplace issues and problems, determine appropriate solutions and present evidence to various stakeholders in an acceptable and understandable format.

Students will have developed skills such as communication literacy, critical thinking, analysis, synthesis, reasoning, and interpretation, which are crucial for gaining employment and developing academic competence.

Learning Outcomes

By the end of this unit students will be able to:

LO1 Examine appropriate research methodologies and approaches as part of the research process

LO2 Conduct and analyse research relevant to a computing research project

LO3 Communicate the outcomes of a research project to identified stakeholders

LO4 Reflect on the application of research methodologies and concepts.

Essential Content

LO1 Examine appropriate research methodologies and approaches as part of the research process

Developing a research proposition:

The importance of developing methodical and valid propositions as the foundation for a research project.

Rationale: the purpose and significance for research question or hypothesis.

The value of the philosophical position of the researcher and the chosen methods.

Use of Saunders' Research Onion as a guide to establishing a methodological approach.

Literature review:

Conceptualisation of the research problem or hypothesis.

The importance of positioning a research project in context of existing knowledge.

Significance and means of providing benchmarks by which data can be judged.

Qualitative, quantitative, and mixed method research methodologies:

Key theoretical frameworks for research.

Advantages and limitations of qualitative and quantitative research approaches and methods.

LO2 Conduct and analyse research relevant to a computing research project

Research as a process:

Follow distinct phases of research to support a coherent and logical argument including using secondary research to inform a primary, empirical study.

Identify the reason and goal of the business research project, e.g. solving identified problems, business expansion, improve competitiveness, response to developments in technology, changes in the industry.

Elicite information from stakeholders.

Application of key skills and behaviours to guide the research project and ensure success, e.g. critical thinking, analysis and reasoning, dealing with difficult situations, misunderstanding or mistakes.

Selecting a sample:

The importance of gathering primary and secondary data and information (qualitative or quantitative) to support research analysis.

Selecting sample types and sizes that are relevant to the research.

Considering sampling approaches and techniques, including probability and non-probability (random) sampling.

Ethics, reliability and validity:

Conduct research ethically including reporting of findings.

Consider how to ensure reliable and valid research.

Analysing data:

Using data collection tools such as interviews and questionnaires.

Using analytical techniques such as trend analysis, coding and typologies.

LO3 **Communicate the outcomes of a research project to identified stakeholders**

Stakeholders:

Techniques to support the identification and analysis of internal and external stakeholders.

Stakeholder analysis to determine approaches to communications, including who the stakeholders are, high and low priority status, type of communication, frequency of communication, level to which the project outcomes are conveyed.

Communicating research outcomes:

Consideration of different methods of communicating outcomes, e.g. written word, spoken word, and the medium, e.g. report, online, presentation. The method and medium will be influenced by the research and its intended audience.

Considerations when communicating with stakeholders, e.g. maintaining privacy and security, tone of voice, use of technical vocabulary or jargon, maintaining or promoting company image.

Convincing arguments:

No matter what the method/medium, all research should be convincing and presented logically where the assumption is that the audience has little or no knowledge of the research process.

The importance of developing evaluative conclusions.

LO4 **Reflect on the application of research methodologies and concepts**

Reflection for learning and practice:

Difference between reflecting on performance and evaluating a research project. The former considers the research process; the latter considers the quality of the research argument and use of evidence.

Reflection on the merits, limitations and potential pitfalls of the chosen methods.

The cycle of reflection:

To include reflection in action and reflection on action.

Considering how to use reflection to inform future behaviour and future considerations.

Reflective writing:

Avoiding generalisation and focusing on personal development and the research journey in a critical and objective way.

Learning Outcomes and Assessment Criteria

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">LO1 Examine appropriate research methodologies and approaches as part of the research process</td><td rowspan="5">D1 Critically evaluate research methodologies and processes in application to a computing research project to justify chosen research methods and analysis.</td></tr>
<tr><td>P1 Produce a research proposal that clearly defines a research question or hypothesis, supported by a literature review.

P2 Examine appropriate research methods and approaches to primary and secondary research.</td><td>M1 Analyse different research approaches and methodology and make justifications for the choice of methods selected based on philosophical/theoretical frameworks.</td></tr>
<tr><td colspan="2">LO2 Conduct and analyse research relevant to a computing research project</td></tr>
<tr><td>P3 Conduct primary and secondary research using appropriate methods for a computing research project that consider costs, access and ethical issues.

P4 Apply appropriate analytical tools, analyse research findings and data.</td><td>M2 Discuss merits, limitations and pitfalls of approaches to data collection and analysis.</td></tr>
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Pass	Merit	Distinction
LO3 Communicate the outcomes of a research project to identified stakeholders		
P5 Communicate research outcomes in an appropriate manner for the intended audience.	**M3** Analyse the extent to which outcomes meet set research objectives and communicate judgements effectively for the intended audience	**D2** Evaluate outcomes and make valid, justified recommendations.
LO4 Reflect on the application of research methodologies and concepts		
P6 Discuss the effectiveness of research methods applied, for meeting objectives of the computing research project. **P7** Discuss alternative research methodologies and lessons learnt in view of the outcomes.	**M4** Analyse results in recommended actions for improvements and future research considerations.	**D3** Demonstrate reflection and engagement in the resource process, leading to recommended actions for future improvement.

Recommended Resources

Textbooks

Cornford, T., Smithson S. (2005) *Project Research in Information Systems: A Student's Guide*. Paperback. Palgrave Macmillan.

Costley, C., Elliott, G. and Gibbs, P. (2010) *Doing Work Based Research: Approaches to Enquiry for Insider-researchers.* London: SAGE.

Fink, A. (2020) *Conducting Research Literature Reviews: From the Internet to Paper*. 5th Ed. Sage Publications Inc.

Flick, U. (2020) *Introducing Research Methodology: A Beginner's Guide to Doing a Research Project.* London: Sage Publications Ltd.

Gray, D.E. (2009) *Doing Research in the Real World.* 2nd Ed. London: SAGE.

Saunders, M., Lewis, P. and Thornhill, A. (2012) *Research Methods for Business Students.* 6th Ed. Harlow: Pearson.

Wellington, J. (2000) *Educational Research: Contemporary Issues and Practical Approaches*. Continuum International Publishing Group Ltd.

Journals

International Journal of Quantitative and Qualitative Research

Qualitative Research

Links

This unit links to the following related units:

Unit 3: Professional Practice

Unit 6: Planning a Computing Project

Unit 7: Software Development Lifecycles.