Pearson
Higher Nationals in
Computing

PEARSON SET ASSIGNMENT

UNIT 13: Computing Research Project

Issue 1

Edexcel, BTEC and LCCI qualifications

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Unit 13 – Computing Research Project

Outline Project Brief and Assessment Criteria

This sample assessment project brief and assessment criteria are for the following qualifications:

Pearson BTEC Level 5 Higher National Diploma in Computing

Pearson BTEC Level 5 Higher National Diploma in Computing (Network Engineering)

Pearson BTEC Level 5 Higher National Diploma in Computing (Software Engineering)

Pearson BTEC Level 5 Higher National Diploma in Computing (Data Analytics)

Pearson BTEC Level 5 Higher National Diploma in Computing (Security)

Pearson BTEC Level 5 Higher National Diploma in Computing (Intelligent Systems)

Pearson BTEC Level 5 Higher National Diploma in Computing (Applications Development)

Contents

Unit Planning

The aim of this unit is to offer students the opportunity to engage in sustained research in a specific field of study. The unit enables students 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. The unit also encourages students to reflect on their engagement in the research process, during which recommendations for future and personal development are key learning points.

Students will choose their own research 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 their chosen specialist pathway.

Centres should consider the best way to deliver the unit according to the needs of the students. Possible delivery methods include whole-class teaching, small group teaching, or e-learning.

The unit should be taught in the way(s) most appropriate to the students and the centre. Some suggestions include:

- a block of lessons at the start of the course
- lessons throughout the course
- small-group teaching, focusing on relevant aspects
- teaching of, or seminars on, research methods, project management, and/or subject-specific skills delivered by external experts.

Delivery should include the development of:

- project management skills
- research skills
- writing, investigative, field study, performance or production skills, as appropriate presentation skills.

Please note that there is a suggested scheme of work for this unit linked to HN Global at www.highernationals.com.

The role of the Tutor

All students should have initial guidance in planning their work and regular monitoring meetings. However, when reviewing drafts of students' work, tutors should ensure they use their professional judgement and do not give excessive guidance. The student should meet individually with their tutor to monitor the research project and ensure it is progressing in an appropriate direction and at a pace which will enable the student to meet the assessment requirements. Students will perform best if some time is allocated within the normal centre timetable for working on the research project. The tutor must be able to authenticate the work as the student's own, which can be done by regular monitoring of progress and conducting interim reviews.

Milestones and interim feedback

The purpose of milestones is to monitor the progress of the project and to maintain momentum, making it more likely that the project will succeed. Each milestone should be a clear, achievable activity that the student aims to achieve by a particular time. Students should agree at least two milestones with their tutor. Examples of milestones include:

- completing and discussing the research proposal form
- producing a first draft of findings
- completing all primary research.

At each milestone, the tutor liaises with the student to check whether it has been achieved. They may need to redirect the student if necessary.

Authentication of a project

Centres are to provide confirmation of the authenticity of a project. It is important that students are made aware of the issue of plagiarism. Students are required to sign a declaration stating that the work they are submitting is their own.

Guidance for Tutors

Research project briefs for this unit must be based on a proposal defined by the student.

- The student must agree and sign off their research proposal with you before embarking on their project. If this requires extra time to agree, this could be addressed through the student's tutorial time.
- On the following pages, there is an example of a research project proposal. This will form the basis of their project and must be related to their specific pathway, unless the student is on the general Computing pathway.
- Students must complete the research project in order to complete their work for this unit.
- Group work is not appropriate for this project. Student work must be individual.
- Students should be taught how to go about planning, researching, conducting, recording and reflecting on the research project.
- It is advisable to direct students to appropriate research sources and advise on qualitative and quantitative methods.
- Students will need to reflect on the success of their research project and their performance at the end of the project, with the inclusion of a project evaluation and recommendations.
- The research project can take the following forms:
  - Dissertation.
  - Feasibility study.
  - Investigation/fieldwork.

Guidance for Students

You should read this information before starting to define and work through your research brief. You should refer to these instructions as you complete work for this unit.

- Consider the development of a methodical and valid research proposal as the foundation for the project.
- Choose a topic of personal interest in a specialism. The topic chosen should allow a sufficient and suitable degree of research through the existence of adequate background materials.
- A good project proposal title should meet the following criteria:
  - The proposal is one that has an existing body of literature or source material that can be reviewed.
  - The proposal extends a current line of learning that will lend itself to further rigorous exploration.

- Decide on appropriate research methods and select an appropriate sample.
- Ensure that your proposal is ethical, reliable and valid. An ethics form must be submitted prior to completion of research as part of the research proposal.
- Agree your research proposal with your tutor before beginning your research.
- Conduct your research as outlined in the proposal agreed with your tutor.
- Carry out your research, analyse your research findings and draw conclusions. Apply both qualitative and quantitative research methods to evaluate data collected from primary research.
- Communicate your research outcomes in a manner appropriate to your audience.
- You will be asked to reflect on the success of your research project and evaluate the problems/issues encountered.
- On the following pages, there is an example of a research project brief.
- You must complete the research project in order to complete your work for this unit.

Proposal form

- You will need to reflect on the success of your research project and your performance at the end of the project with the inclusion of a project evaluation and recommendations.
- The research project can take the following forms:
  - Dissertation.
  - Feasibility study.
  - Investigation/fieldwork.

Computing Research Project Brief

- Define your research problem or question. This can be stated as a research question, objectives or hypothesis.
- Provide a literature review giving the background and conceptualisation of your proposed area of study. This would provide existing knowledge and benchmarks by which your data can be judged.
- Consider and define your research methodology and research process. Demonstrate understanding of the pitfalls and limitations of the methods chosen and ethical issues that might arise.
- Draw points (1–3, above) together into a research proposal for agreement with your tutor.
- Conduct your research as outlined in your proposal. Keep track of your findings as you work.
- Carry out your research and analyse your findings in relation to your original research question. Draw conclusions.
- Communicate the outcomes of your research project to the identified audience.
- Reflect on the success of your research project and your performance at the end of the project with the inclusion of a project evaluation and recommendations.

Templates

Research Proposal Form

Student name ..... Student number .....

Centre name ..... Date .....

Tutor .....

Unit .....

Proposed title .....

Section One: Title, objective, responsibilities
Title or working title of research project (in the form of a question, objective or hypothesis): Research project objectives (e.g. what is the question you want to answer? What do you want to learn how to do? What do you want to find out?):
Section Two: Reasons for choosing this research project
Reasons for choosing the project (e.g. links to other subjects you are studying, personal interest, future plans, knowledge/skills you want to improve, why the topic is important):
Section Three: Literature sources searched
Use of key literature sources to support your research question, objective or hypothesis:

Section Four: Activities and timescales	
Activities to be carried out during the research project (e.g. research, development, analysis of ideas, writing, data collection, numerical analysis, tutor meetings, production of final outcome, evaluation, writing the report) and likely durations:	

Milestone one: .....

Target date (set by tutor): .....

Milestone two: .....

Target date (set by tutor): .....

Section Four: Research approach and methodologies

Type of research approach and methodologies you are likely to use, and reasons for your choice:

What your areas of research will cover:

Comments and agreement from tutor

Comments (optional):

I confirm that the project is not work which has been or will be submitted for another qualification and is appropriate.

Agreed: ..... (Name) ..... (Date) .....

Comments and agreement from project proposal checker (if applicable)

Comments (optional):

I confirm that the project is appropriate.

Agreed: ..... (Name) ..... (Date) .....

Research Ethics Approval Form

All students conducting research activity that involves human participants or the use of data collected from human participants are required to gain ethical approval before commencing their research. Please answer all relevant questions and note that your form may be returned if incomplete.

For further support and guidance please see your respective Unit Tutor.

Before completing this form, we advise that you discuss your proposed research fully with your Unit Tutor. Please complete this form in good time before your research project is due to commence.

Section One: Basic details

Project title: .....

.....

Student name: .....

Student number: .....

Programme: .....

School: .....

Intended research start date: .....

Intended research end date: .....

Section Two: Project summary

Please select all research methods that you plan to use as part of your project:

- Interviews ☐
- Questionnaires ☐
- Observations ☐
- Use of personal records ☐
- Data analysis ☐
- Action research ☐
- Focus groups ☐
- Other (please specify): .....

Section Three: Participants

Please answer the following questions, giving full details where necessary.

Will your research involve human participants?

Who are the participants? Tick all that apply:

Children aged 12–16: ☐ Young people aged 17–18: ☐ Adults: ☐

How will participants be recruited (identified and approached)?

Describe the processes you will use to inform participants about what you are doing:

How will you obtain consent from participants? Will this be written? How will it be made clear to participants that they may withdraw consent to participate at any time?

Studies involving questionnaires:

Will participants be given the option of omitting questions they do not wish to answer?

Yes: ☐ No: ☐

If No please explain why below and ensure that you cover any ethical issues arising from this:

Studies involving observation:

Confirm whether participants will be asked for their informed consent to be observed.

Yes: ☐ No: ☐

Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?

Yes: ☐ No: ☐

Will participants be given information about the findings of your study? (This could be a brief summary of your findings in general.)

Yes: ☐ No: ☐

Section Four: Data storage and security

Confirm that all personal data will be stored and processed in compliance with the Data Protection Act (1998):

Yes: ☐ No: ☐

Who will have access to the data and personal information?

During the research:

Where will the data be stored?

Will mobile devices (such as USB storage and laptops) be used?

Yes: ☐ No: ☐

If yes, please provide further details:

After the research:

Where will the data be stored?

How long will the data and records be kept for and in what format?

Will data be kept for use by other researchers?

Yes: ☐ No: ☐

If yes, please provide further details:

Section Five: Ethical issues

Are there any particular features of your proposed work which may raise ethical concerns? If so, please outline how you will deal with these:

It is important that you demonstrate your awareness of potential risks that may arise as a result of your research. Please consider/address all issues that may apply. Ethical concerns may include, but are not limited to the following:

- Informed consent.
- Potentially vulnerable participants.
- Sensitive topics.
- Risks to participants and/or researchers.
- Confidentiality/anonymity.
- Disclosures/limits to confidentiality.
- Data storage and security, both during and after the research (including transfer, sharing, encryption, protection).
- Reporting.
- Dissemination and use of your findings.

Section Six: Declaration

I have read, understood and will abide by *[insert centre name]* Research Ethics Policy:

Yes: ☐ No: ☐

I have discussed the ethical issues relating to my research with my Unit Tutor:

Yes: ☐ No: ☐

I confirm that to the best of my knowledge:

The above information is correct and that this is a full description of the ethics issues that may arise in the course of my research.

Name: .....

Date: .....

Please submit your completed form to: .....

Assessment Criteria

<table>
<tr><th colspan="3">Learning Outcomes and Assessment Criteria</th></tr>
<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">LO1 & 2
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 Evaluate 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 for 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>
<tr><td colspan="2">LO3 Communicate the outcomes of a research project to identified stakeholders</td></tr>
<tr><td>P5 Communicate research outcomes in an appropriate manner for the intended audience.</td><td>M3 Coherently and logically communicate outcomes to the intended audience demonstrating how outcomes meet set research objectives.</td><td>D2 Communicate critical analysis of the outcomes and make valid, justified recommendations.</td></tr>
<tr><td colspan="2">LO4 Reflect on the application of research methodologies and concepts</td><td rowspan="2">D3 Demonstrate reflection and engagement in the resource process leading to recommended actions for future improvement.</td></tr>
<tr><td>P6 Reflect on the effectiveness of research methods applied for meeting objectives of the business research project.

P7 Consider alternative research methodologies and lessons learnt in view of the outcomes.</td><td>M4 Provide critical reflection and insight that results in recommended actions for improvements and future research considerations.</td></tr>
</table>