

PROJECT PROPOSAL

Student name: Walter Ernesto Melendez Dominguez

Student number: 2413597

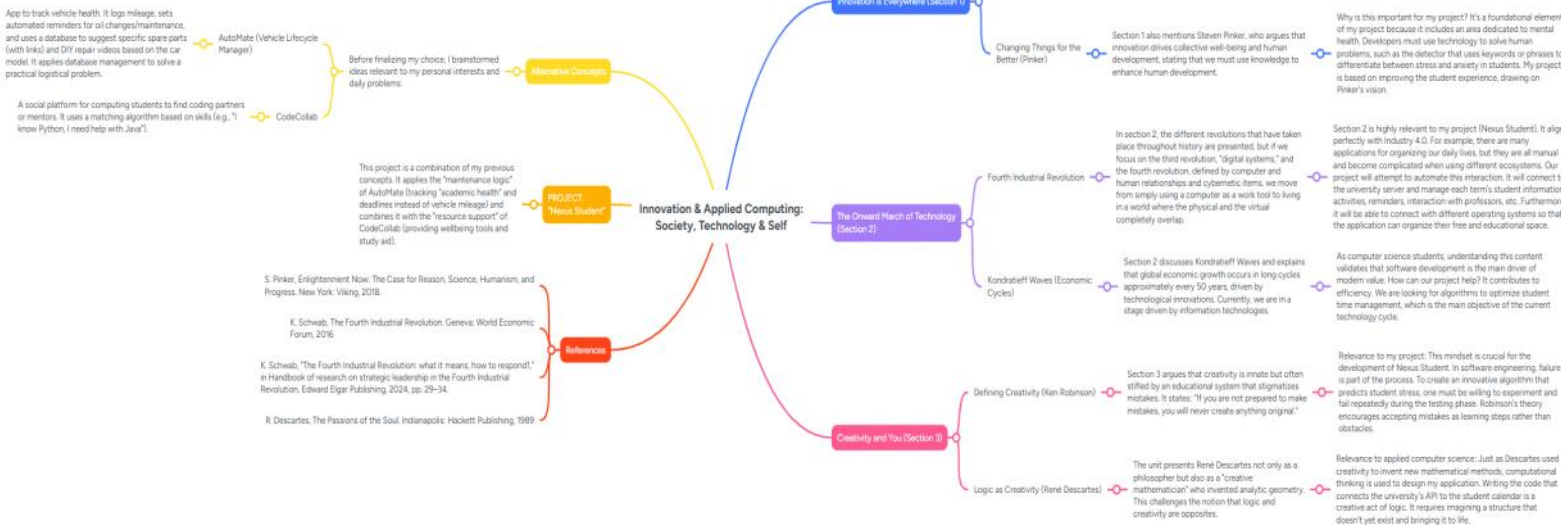
Module: Changemakers: Creativity and Value Creation (ACCA5033_LON)

Course: BSc Applied Computing

e-Portfolio: [https://uowtsd-my.sharepoint.com/personal/2413597_student_uwtsd_ac_uk/_layouts/Doc.aspx?sourcedoc={CA81B59F-D6CF-4066-9A87-7E2A674DCC40}&end=\(\)](https://uowtsd-my.sharepoint.com/personal/2413597_student_uwtsd_ac_uk/_layouts/Doc.aspx?sourcedoc={CA81B59F-D6CF-4066-9A87-7E2A674DCC40}&end=())

Task 1: Ideation & Mind Map

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Task 2: Aim & Research Area.

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Q1. Create and document a single goal and multiple objectives for your project.

Project Title: Nexus Student: An Intelligent Academic Assistant

Project Goal: The main goal of this project is to design and develop a prototype mobile application called "Nexus Student" that leverages Artificial Intelligence (AI) and API integration to automate academic organization and monitor student well-being. The project seeks to address the problem of academic burnout by creating a unified platform that connects university administrative systems with students' personal mental health needs, if they so choose, thus fostering the "collective well-being" described by Pinker (2018).[2]

Project Objectives: To achieve this goal, the following specific objectives have been defined:
Objective (Research and Analysis): Analyze current challenges related to time management and address the field of mental health among university students by identifying gaps in a campus-integrated solution.

Objective 2 (System Design): Design the system architecture and user interface (UI) for "Nexus Student," focusing on the secure integration of the University's APIs for real-time schedule synchronization and the development of an intuitive "Wellbeing Dashboard."

Objective 3 (Simulation): Create a simulation of the "Nexus Student" application. This involves building the visual interface and demonstrating the functionality of the main features (such as the calendar view and wellbeing alerts), using design tools or basic code structures to validate the concept.

Objective 4 (Testing and Evaluation): Evaluate the effectiveness of the application through User Acceptance Testing (UAT) with a small group of students, measuring whether task automation effectively reduces perceived academic anxiety.

Q3: Search Tools and Strategies

Described in Unit 1 Topic 3[1], I will select appropriate databases to identify high-quality resources:

UWTSD Library Resources: As suggested in the course material, I will prioritize the university library to access trusted e-journals and technical standards that are often behind paywalls on the open web.

IEEE Xplore: This database is essential for Applied Computing. I will use it to find technical papers on "Cyber-Physical Systems" and software architecture.

Google Scholar: While accessible, I will use this cautiously to identify broader themes regarding student mental health.

Search Strategies (The "Known Knowns")

Boolean Search Strategies: To narrow down the number of hits, I will use operators to refine my results:

Search String: ("Artificial Intelligence" OR "Machine Learning") AND "Student Wellbeing".

Identifying "Known Unknowns": Using the Rumsfeld matrix from the course notes[1], I have identified my "Known Unknowns"—topics I am aware of but do not yet understand (e.g., the specific API documentation for university calendars). My search will specifically target these gaps.

Evaluating Information (The CRAAP Test) Since the internet lacks quality control, I will apply the CRAAP test to evaluate every source before using it in my project:[4]

- Currency: Is the information recent? For this App, I will discard technical sources older than 5 years (pre-2019) as technology changes rapidly.
- Relevance: Does it specifically relate to university students?
- Authority: Is the author a credible software engineer or psychologist?
- Accuracy: Is the information peer-reviewed?
- Purpose: Is the source objective, or is it trying to sell a product?

Q2. Research Philosophy: Pragmatism

Based on the nature of this project, I have identified Pragmatism as the most appropriate research philosophy. As stated in the course notes (Unit 1 Topic 2)[1], Pragmatism operates on the core epistemological belief that "if it works, it's true."

My choice is justified by the following factors extracted from the unit material:

Focus on action: The course material explains that "a pragmatist only considers concepts relevant if they support action." The goal of Nexus Student is not simply to observe student behaviour (which would be interpretivism), but to act by developing a software tool that solves a logistical problem.[3]

Dynamic truth (Technology): The notes highlight an advantage of pragmatism: it recognizes that truth changes over time, especially with regard to technology. In applied computing, solutions quickly become obsolete. But success will be defined by measurable objectives.

Addressing the limitations: I am aware of the drawbacks mentioned in the notes (e.g., the Fukushima example)[1], which warn that "what works" may be a poorly defined concept.

References

[1] University of Wales Trinity Saint David, "Unit 1: Innovation and Research Skills," *BSc Applied Computing Course Notes*, 2024.
[2] S. Pinker, *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress*. New York, NY, USA: Viking, 2018.
[3] B. J. Oates, *Researching Information Systems and Computing*. London, UK: SAGE Publications, 2006.
[4] S. Blakeslee, "The CRAAP test," *LOEX Quarterly*, vol. 31, no. 3, pp. 6–7, 2004.

Task 3: Research Strategies.

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Q1. Validity, Reliability, and Generalizability Strategies

To ensure the robustness of the data collected for "Nexus Student," I will implement strategies based on the course material on research methodology [1].

Validity (avoiding bias): I am aware of the Hawthorne Effect, where participants behave differently when observed [1]. To maximize validity and minimize this bias, the application will automatically record usage data (passive collection) instead of relying solely on student self-reports, which could be exaggerated.

Reliability: To ensure consistency, I will use standardized questions in my surveys [2]. This ensures that all participants interpret the questions in the same way, reducing errors.

Generalizability (sampling): To ensure that the findings apply to the general student population, I will use cluster sampling, as defined in the course notes [1]. I will divide the university into groups based on faculties (e.g., Engineering, Arts, Business) and randomly select groups from each to ensure the application works for everyone, not just computer science students.

Ethical considerations: Following research ethics guidelines [3], I will ensure informed consent (participants sign a form) and anonymity (data is removed from personal names) to protect student privacy.

Q2. Data Collection Methods and Pilot Design

Following the guidelines in Section 3 ("Designing a Data Collection Method") [1], I have structured my approach to investigating the problem of student burnout using mixed methods:

Quantitative Method (Surveys): I will use online questionnaires. As stated in the slides, "data is being collected all around us" [1], so I will use a familiar format (such as a Microsoft Form) to gather statistics on study habits.

Qualitative Method (Interviews): To understand the user experience, I will conduct brief interviews using Typical Case Sampling [1]. This involves interviewing the "average" student who struggles with time management, rather than extreme cases, to obtain data relevant to the majority.

Pilot Data Collection Design: To validate this method, I created a Pilot Survey (see Appendix A). I tested it with three classmates to refine my approach before the main study [2].

Comments: A colleague felt the question "Are you stressed?" was too vague.

Refinement: I changed it to a scale (1-10) to make the data measurable.

References

- [1] University of Wales Trinity Saint David, "Unit 2: Research Methodology and Data Collection," *BSc Applied Computing Course Notes*, 2024.
- [2] B. J. Oates, *Researching Information Systems and Computing*. London, UK: SAGE Publications, 2006.
- [3] J. W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 4th ed. Thousand Oaks, CA: SAGE Publications, 2014.
- [4] University of Wales Trinity Saint David, "Unit 4: Data Analysis," *BSc Applied Computing Course Notes*, 2024.

Q3. Quantitative and Qualitative Analysis

To analyse the data, I will use specific techniques from Unit 4 Topic 1 & 2 [4]:

- **Quantitative Analysis (Descriptive Statistics):** I will use Descriptive Statistics (Mean and Percentages) to analyse the survey results. For example, I will calculate the percentage of students who reported a reduction in anxiety after using the app. This provides the "hard data."
- **Qualitative Analysis (Thematic Analysis):** For the interviews, I will use Thematic Analysis following the 6 Steps outlined in the course notes (Familiarising, Generating codes, Identifying themes, etc.) [4].
 - **Technique:** I will create a Theme Table (as shown in the "Apply" section). I will take excerpts from the student transcripts and assign them an "Initial Code" (e.g., "Feature Request" or "Stress Trigger").
 - **Software:** While the course mentions Qualitative Analysis Software (Section 3) for large projects, for this pilot, I will use Microsoft Excel to create my Theme Table manually. The course notes warn that software can be "cumbersome" for small datasets and may demand "quantity over depth" [4], so a manual approach is more appropriate for this stage.

Appendix A

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Appendix A: Pilot Data Collection Tool (*Draft Survey designed for Microsoft Forms*)

Title: Student Time Management & Wellbeing Survey Introduction: *This survey is anonymous, and data will be used for a pilot research project on App development.*

1. Demographics (Stratified Sampling)

Which year of study are you currently in? ☐ Year 1 ☐ Year 2 ☐ Year 3+

2. Quantitative Questions (Likert Scale & Stats)

On a scale of 1-10, how overwhelmed do you feel by your current deadline schedule? (1 = Not at all, 10 = Extremely overwhelmed)

On average, how many deadlines do you miss per semester? ☐ 0 ☐ 1-2 ☐ 3+

3. Qualitative Questions (Open-Ended)

"Do you feel that current calendar apps help or increase your stress? Please explain briefly."

[_____]

4. Bias Check (Hawthorne Effect)

"If an App tracked your study hours automatically, would you study more just to 'look good' for the algorithm?"

☐ Yes ☐ No