RESEARCH REPORT ASSIGNMENT OVERVIEW

The Research Report is your major project for the semester and is worth 65% of your final grade, so please read everything carefully and be sure to ask questions on the Need Help/Give Help discussion board on Blackboard.

The purpose of this assignment is to define and analyze a SPECIFIC TECHNICAL PROBLEM and its SUSTAINABLE SOLUTION.

To do this you will be creating a clear and concise TOPIC STATEMENT, a RESEARCH PROPOSAL, a PROGRESS REPORT and the final RESEARCH REPORT.

You must follow the specific organization and formatting instructions outlined in this overview and explained online prior to each step in the Research Report process.

The Research Report assignment is divided into four steps. Each step will be posted in advance, with clear guidelines for content and structure.
You may want to download this document as you will likely need to refer back to it before completing each step.

Step	Due Date	Worth
1. TOPIC STATEMENT	Monday, October 18 @ 11:59 pm	10%
2. RESEARCH PROPOSAL	Monday, November 8 @ 11:59 pm	15%
3. PROGRESS REPORT	Monday, November 29 @ 11:59 pm	10%
4. RESEARCH REPORT	Monday, December 13 @ 11:59 pm	30%
	TOTAL	65%

TOPIC

Your topic must:
1. Be technical
2. Follow a **Problem/Solution model** (*Module 4 contains student exemplars and guidelines on defining an effective topic and you can use the Topic Checklist to work through your ideas*)
3. Have a **Sustainable Solution**
4. Relate back to one (or more) of the **UN Sustainable Development Goals**

SUGGESTED TOPICS

From the broad topics below, you will identify a specific, technological problem. Based on that problem, you will discover and research an existing technical, sustainable solution to that problem. In addition to this, you will read through and relate your problem-solution back to one of the UN Sustainable Development Goals.

- Building design

- Drinkable water
- E-waste
- Food insecurity
- Human-caused climate change
- Polluted waterways
- Public transit
- Sources of power generation (renewable, nuclear, coal, natural gas, etc.)
- Web content accessibility

RESEARCH

You must use a minimum of FOUR secondary sources in the final report. Of these, one must be scholarly (from Humber Library's databases, Google Scholar, etc.):

- One source will be used to provide evidence that the problem is relevant, current, and valid.
- The other three or more sources will be used as sources for the solution you've chosen.
- Commercial sites such as business/marketing pages may be used to augment your research but will not count towards your mandatory three secondary sources.

REQUIRED CONTENT

The problem and solution must be specific, technical, adequately researched, and thoroughly explained. The report must:

- Have a clear problem/solution structure.
- The solution must respond to the problem.
- You must define all terminology for a layperson audience.
- The report must have at least one mechanism description or process analysis.
- The solution section must be supported with at least one visual element (schematic, graph, table, diagram, etc.) that supplements the process or component analysis.
- All material *and* visuals must be properly cited in APA format.

FORMATTING

All assignments related to the final Research Report must follow this format:

- Single-spaced content
- Double-spaced headings
- Full-Block format
- Numbered pages
- Arial 10-point font or Calibri 11-point font
- Changes to font size, bold font, and headings wherever required for clarity
- Use plain English for a layperson reader
- Proofread and edited for grammar and mechanics
- Maintain a professional tone

The **PROGRESS REPORT** and final **RESEARCH REPORT** **must**:

- Have a clear problem/solution structure
- Feature effective headings and subheadings
- Include visuals (images, charts, graphics)
- Contain all the necessary sections and elements (see details below)

FINAL REPORT SECTIONS / STRUCTURE

The final Research Report will be divided into three major sections as follows:

1. Front Section

- Title Page
- Executive Summary
- Table of Contents
- List of Figures
- Glossary of Technical Terms

2. Main Report Section

- Introduction
- Body (Problem/Solution)
- Conclusion

3. Back Section

- References in correct APA format
- Appendices (optional)

REPORT STRUCTURE

Below is an example of a potential Technical Research Report Outline. It includes suggested headings and subheadings. These were designed to promote a deeper engagement with and understanding of the relationship between problem and solution. The suggestions below should also promote a systematic approach to exploring and researching the problem and solution.

NOTE:

Headings and subheadings are **suggestions only** and are meant to provide an extensive list for you to choose from based on your topic and relevance.

FINAL REPORT OUTLINE EXEMPLAR

1. INTRODUCTION

1.1. Purpose

- Open with a **one-sentence** problem statement: what is the problem?
- What would the world look like if the problem was solved (ideal case)?

1.2. Problem/Solution

- Is your perspective of the problem shaped by your current world view (studentlocating themselves in relation to the issue)?
- How does this investigation challenge your personal and/or popular assumptions?

1.3. Focus/Limitations

- What's the scope or "boundary" of your investigation and why do you think so?
- Local vs. global impact of the topic

1.4. Research Methods

- Connection to UN Sustainable Development Goals

1.5. Useful Sources

- What are the most useful sources (be specific)?
- What does the reader need to know to understand the technical information?

2. PROBLEM

2.1. Background

- Open with a **one-sentence** problem statement: what is the problem?
- What would the world look like if the problem was solved (ideal case)?
- What is a specific example or instance of the problem? (Where? When?)
- How does it work?
- How did that problem come about?

- What are the causes (direct, underlying, root)?
- What is the history of this issue?
- How is this issue related to other issues?
- What laws, rules, and practices contribute to the problem?
- How does the problem happen? What does it look like? How do we knowthere's a problem?
- Which UN Sustainable Development Goal is connected to this issue?

2.2. Explanation

- How do you define what elements constitute this problem, and whichones do not?
- What aspects of the problem have been overlooked?
- What habits and mindsets are part of the problem?
- Who is affected? Who are the direct stakeholders? Who are the indirect stakeholders?
- What is the wider context that this problem exists in?
- What perspectives, viewpoints, and contexts are necessary to understand the problem?

2.3. Effects

- Are there impacts on the environment?
- Is this a local and/or global concern?
- Are some people more seriously impacted than others?
- What will happen if the problem isn't "fixed"?

3. SOLUTION

3.1. Background

- Open with a **one-sentence** function & purpose statement: What is the technology called? What does it do? Why does it do this?
- How does it compare and/or contrast to conventional technologies that have thesame function and purpose?
- Who developed this solution and what is their relationship to the issue?

- Which environments/situations is this solution most applicable to?
- What is the history/background of this specific solution?
    - How long has it been used? Where? How?
    - How has its use changed over time?

3.2. Explanation

- How does it work?
- What are the components of the solution?
- What is needed for the solution to function optimally?
- How does it solve or reduce the problems? (connect to the problems' causes)
- How well developed is it now (i.e., design prototype, scaling up, or full-scale manufacturing)?
- Can you (student) participate in the solution in a way that affects your perspective of it?
- Are the companies that produce this technology socially responsible (do they build an inclusive company culture, practice diverse recruitment and recruitment practices, practice user-centered design, and minimize harm caused by naïve and biased approaches, employees reflect customers, diverse set of voices and experiences, responsive to the diverse needs and demands of users)?
- Do any laws, policies, or practices need to be changed for the solution to be implemented?
- Has it been implemented? If so, where and when?
- What solutions have been proposed/attempted?
- What are some existing solutions? Which has been more, or less successful and why?
- How does this solution compare to other potential solutions?
- What resources (research, funding) have been dedicated to solving the issue?
- What other changes would help strengthen the impact of this solution?

3.3. Effects

- Are there unintended ramifications/emergent properties of this solution ofwhich users should be aware?
- What are the possible social, economic, and environmental consequences of the

solution? For example, will it reduce or reinforce inequalities? Will it create or eliminate jobs? Will it reduce or contribute to climate change?

- Who will be impacted by this solution? Were all the groups consulted?
- What are the benefits of this solution?
- What are the drawbacks or limits of this solution?
- Who will not benefit from this solution?
- Which aspects of the issue are not resolved by this solution?
- What is the significance of the solution on a local AND global level?

4. CONCLUSION

4.1. Key Information

- Whose approval is required for its implementation?
- Closing remarks on why the solution presents a new direction and what the future may hold.
- Which UN Sustainable Development Goal is being met by this solution?

4.2. A Look to the Future

- What is its potential for implementation?
- Scaling impact – what are the impacts (social, environmental, economic) when scaling up your solution's technology? Is bigger, better?