Aviation Research Project: an overview

What is a research project?
- An independent or collaborative exploration of a topic or issue in your field

Why undertake a research project?
- Develop your research skills
- Develop your ability to work individually or collaboratively to solve problems
- Develop your critical thinking, leadership, time management & higher level communication skills
- Build your knowledge and understanding
- Explore answers to questions of great interest to you
- Create new ideas, innovate
- Gain experience & workplace readiness

Key steps in undertaking a research project
Note that these steps are not linear and you may go back and forward through these steps as your project proceeds.
- Define your topic broadly, then narrow down your topic to identify key questions or issues that need to be resolved.
- Design your research methods based on these questions.
- Read literature connected to your research topic at each of these steps.
- Conduct your research, that is collect information to answer your research question
- Analyse your research data.
- Communicate your research project in the research report or paper.

Define your topic
- Choose a topic or issue of interest or value to you
- Decide why this is important to investigate
- Identify a gap, i.e. what we still need to know about this topic

Define your research question/statement
- Precisely state the focus of your research
- Present in question format or statement format
- Keep it manageable/doable

How?
- By reading the literature on your topic & refining your thinking and understanding
What is critical thinking?

- Critical thinking does not mean to criticise or find fault with current research or current literature related to your research questions.
- Critical thinking involves a deeper level of analysis and evaluation of the topic.
- You look beyond the surface level:
  - look at implications of information and give reasons for opinions
  - systematically collect information from a variety of sources - asking questions
  - sort, classify and compare ideas
  - transfer known information to another area and accept multiple answers
  - judge credibility of resources, locate inconsistencies and faulty reasoning

What is critical reading?

- Critical thinking is connected to critical reading of the literature related to your topic.
- Key questions to ask yourself as you read to give you a deeper understanding:
  - What credibility does the author have in this field?
  - What is significant or important about this text?
  - What claims are being made?
  - What evidence is used?
  - How logical are the ideas?
  - Do the conclusions follow from the evidence?
  - How valid and generalisable are the conclusions?

Read and use credible, scholarly sources

- Scholarly sources include journals, textbooks and government reports.
- These have been refereed, peer-reviewed or have gone through a rigorous editorial process.
- In aviation, reports from governing bodies such as CASA or FAA are also considered appropriate.

| ❌ | Young Aviators (monthly magazine) |
| ❌ | A fictional story on your topic |
| ❌ | A Wikipedia entry (source unknown) |
| ❌ | A television news story on your topic |
| ❌ | An aeronautical engineering blog |
| ❌ | An aviation website (unless by a governing body such as CASA or FAA) |
| ✔ | An aviation journal (refereed) |
| ✔ | The University of New York website |
| ✔ | A peer reviewed conference paper at the Research in Higher Education conference |
| ✔ | An Australian Government report on your topic |
Communicating about your topic

- This occurs at various sections in your research report or paper.
- In this extract, the topic of this paper (improving runway safety) is broadly stated in the abstract.
- The topic, as stated more specifically in the title, is about tower controllers’ response behaviour to runway safety alerts.

Communicating about the importance of your research

- This often appears in the abstract and introduction, and may additionally be included in the conclusion.
- Note the language the writer has used to communicate the need to undertake this research.
- Words such as ‘therefore’ and phrases such as ‘it is important to understand’ signal to the reader the significance of the research.

Communicating about the research gap

- You identify this gap after a review of the literature.
- This ensures that the significance or need to undertake the research is clear.
- Phrases such as ‘we lack an understanding of the impact’ are used to communicate the gap.
- This is closely connected to the research topic as communicated in the title and abstract.

(Sanchez & Smith 2010, p. 50)
Design your research methods

- How are you going to gather information to help you answer your research question?
  - Organisational review?
  - Document analysis?
  - Review of the literature?
  - Simulations?
  - Observations?
  - Surveys or questionnaires?
  - Interviews?
  - Experiment?
- Choose an approach that best suits your topic and question

Writing up your research report

(NOTE: Check your assignment instructions for any specific requirements)

<table>
<thead>
<tr>
<th>Preliminary Sections</th>
<th>Main Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title page</strong></td>
<td><strong>Introduction</strong></td>
</tr>
<tr>
<td>This is a separate page with title of the report, name, ID and other identifying details as requested.</td>
<td>This section provides contextual information to set the scene for your research project and also usually includes these subsections: background, why this research is needed, the research questions and an outline of your report. The length depends on your word requirement (usually 10%).</td>
</tr>
<tr>
<td><strong>Acknowledgements</strong></td>
<td><strong>Literature Review</strong></td>
</tr>
<tr>
<td>Acknowledge any assistance, editing or contribution by another person or organisation.</td>
<td>This is a more detailed presentation of information related to your research project. You will draw on literature related to your topic including journal articles, reports and other scholarly sources.</td>
</tr>
<tr>
<td><strong>Abstract</strong></td>
<td><strong>Research design (methodology)</strong></td>
</tr>
<tr>
<td>This is an overview or brief synopsis of the research project. The length depends on the word requirement of your assignment (usually 150-250 words).</td>
<td>This section details how you went about answering your research question/s.</td>
</tr>
<tr>
<td><strong>Table of contents</strong></td>
<td><strong>Findings</strong></td>
</tr>
<tr>
<td>This is a list of sections/ headings and page numbers. The heading of this page is Contents. A list of tables and a list of figures may also be included on a separate page if more than a few of each are used.</td>
<td>This section includes the details of what you found out through your investigation or research into your topic.</td>
</tr>
</tbody>
</table>
Main Sections

Discussion and/or Conclusion
This is the summary of the major findings and analysis of these findings (discussion), along with their implications.

Recommendations
This includes what needs to be done as a consequence of the conclusion.

Supplementary Sections

References
This is a list of the references cited in the report. For further guidance about referencing and avoiding plagiarism, check the UniSA website on referencing.

Appendices (if required)
This includes supplementary materials placed at the end rather than in the main section where they might distract from the flow of the discussion.

Note: If you collect your research data by doing a literature review, your report structure will be:

Abstract
Introduction
Methods/procedures
Findings
Discussion/Conclusion
Recommendations
References
Appendices

References