Capstone Project Handbook
Acquisition Sciences Group

October 30, 2026

IMPORTANT! Download the latest version of this handbook, resident or distance learning capstone project plan and resources at https://nps.edu/web/acqnresearch/for-students.
If you have any questions, please contact Jochele Benson at arp@nps.edu.

The handbook applies to graduate students in the **Resident Degree Programs: 815** Defense Contract Management **(CM)**, **816** Defense Program Management **(PM)** and **837** Defense Financial Management **(FM)**.

It also applies to **Distance Learning Degree Programs: 835** MS Acquisition – Contract Management **(MSA-CM)** and **836** MS Acquisition – Program Management **(MSA-PM)**.

It addresses the full capstone process, including topic and research-question development, analysis and data-collection planning, report preparation and editing, presentation of results, administrative requirements, final submission, and NPS writing and formatting standards.

The handbook is used in MN4044 / MN4045 for resident students and in MN4101 and MN4102 for distance learning students.

Generative AI Disclosure. Microsoft Copilot supported the development, organization, and editorial refinement of this guide. The authors reviewed, revised, and validated all AI-assisted content and remain responsible for the guide's accuracy and final content.

Approved for public release; distribution is unlimited.

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Disclaimer: The views expressed are those of the author(s) and do not reflect the official policy or position of the Naval Postgraduate School, US Navy, Department of Defense, or the US government.

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Introduction

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This guide helps Acquisition Sciences students plan and complete a focused, analysis-centered capstone project that meets graduate-level expectations and NPS requirements. It explains the major stages of the capstone process; shows how research questions connect to the analysis and evidence needed to answer them; outlines key administrative milestones and deliverables; and offers practical guidance for producing a clear, credible, and professionally presented report.

The chapters follow the capstone process from early planning through final presentation and submission. Chapter 1 introduces the analysis-first approach and analysis planning matrix. Chapters 2 and 3 cover report structure and administrative requirements. Chapters 4–6 guide topic refinement, research-question development, methodology, literature review, and data-collection planning. Chapters 7 and 8 address presentation of results and APA 7 citations and references. Read the guide in sequence or return to individual sections as your project develops.

Chapter 1 provides a concise planning overview and introduces the analysis planning matrix. Chapter 6 returns to the matrix with a detailed example showing how research questions connect to the required analysis and supporting data. Use both chapters with advisor direction and current NPS, program, and Thesis Processing Office requirements.

The handbook applies to graduate students in the **Resident Degree Programs: 815** Defense Contract Management **(CM)**, **816** Defense Program Management **(PM)** and **837** Defense Financial Management **(FM)**.

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Chapter 1: Overview - Planning for an Analysis-Centered Capstone Research Report

IMPORTANT! **Quality data from reliable sources is critical to your success.** The analysis planning matrix method below can help you evaluate potential research topics and determine whether the data needed to answer your research questions is available and accessible. **If you cannot secure the necessary data, you will need to refine the effort, adjust your research questions, or select another topic.** Planning and running your topic through the matrix prior to committing to it saves you a lot of time and unnecessary pain. **ARP has sponsored research topics for your consideration.**

This is a bottom-line up front (BLUF) approach to completing your capstone research project and report. Use this guide to build your analysis plan before conducting an extensive literature review or collecting data. In this guide, data refers broadly to the numerical, textual, visual, and other evidence used to answer your research questions, including information drawn from properly cited sources. The techniques will help you focus collection, sharpen your research questions, recognize when to adjust the scope, and avoid wasted effort.

You may have completed shorter assignments, such as class papers, point papers, or decision briefs. Those projects build critical thinking and writing skills, but the methods used for them may not scale to a graduate-level capstone.

For a short assignment, you may collect broadly related information, keep what is useful, and discard the rest. That approach is manageable on a limited project. On a capstone, however, allowing available data to drive the analysis creates several problems:

1. **Wasted time.** You may collect data you never use and spend additional time sorting through material to find what matters.
2. **Data-driven analysis.** You may shape the analysis around available data instead of defining the analysis first and collecting the evidence needed to support it.
3. **Unclear scope.** You may discover too late that the topic is too broad, the data are unmanageable, or the project must be narrowed.
4. **Weak organization.** Structuring the report around collected data rather than analytical logic makes the argument harder to follow and the conclusions less clear.

Every source was created for a specific subject, purpose, and audience that may not match yours. Select evidence because it helps answer your research questions; do not reshape the questions simply because certain data is available.

Your capstone has its own purpose, audience, and analytical logic. Collect data that supports the research process—not research that fits the available data.

IMPORTANT! A graduate-level capstone demonstrates critical thinking through analysis—not simply data collection. Define the analysis first, then collect the data needed to support it.

Do not underestimate the value of quality data. Effective analysis requires accurate, unbiased, and sufficient evidence that will support the research effort. Data alone is not the final product; the core of graduate research is synthesizing evidence into a clear, logical answer to the research questions. That synthesis drives the analysis plan.

1.1 Research Topic

Your research topic is the best place to begin your analysis plan. Most students start with a topic that is still fairly broad, and that is completely normal. As you learn more about the issue, the available data, and the time required to complete the work, your topic will likely go through several rounds of refinement before it is ready.

Refining your topic is an expected and important part of the research planning process. Do not be concerned if the scope or focus changes as you gain a better understanding of what can be researched effectively. Your advisors will help you determine whether the topic is appropriately focused, and any final scope should be developed in consultation with them.

1.2 Research Questions

After you have a working topic, the next step is to develop primary and secondary research questions that will guide the rest of the project. These questions are central to the analysis plan because they help determine what you need to explain, what evidence you need to collect, and how the final report should be organized.

As you draft your questions, think about what your readers will need to understand before they can accept your answer to the primary research question. The secondary questions should identify the major pieces of the analysis that you, as the researcher, must present clearly and logically.

Like the topic itself, your research questions will likely change as the project develops. You may refine the wording, narrow the scope, eliminate questions that no longer fit, or add

questions that better support the analysis. This process is normal and expected, and your advisors can help you shape the final set of questions, so they directly support the primary research question.

1.3 Analysis Planning Matrix

Your research questions are the starting point for building the analysis planning matrix. Although the matrix may sound intimidating at first, it is simply a tool for breaking your research questions into the smaller pieces of analysis needed to answer them well. As you build the matrix, put yourself in your reader's position and ask: What information, logic, and evidence would readers need to see before they would feel confident that each question has been fully addressed?

For the matrix to be useful, complete it before you begin collecting data. The purpose is to organize your analysis first, then collect the data needed to support that analysis to answer your research questions. This helps keep the research focused and prevents the data-collection effort from driving the project in an unplanned direction.

Matrix Elements

The matrix has three main parts: the secondary research questions, the analysis needed to answer each question, and the supporting data needed to complete that analysis.

Analysis Planning Research Matrix

Research Question	Analysis Needed	Data Needed
	•	•
	•	•
	•	•

Your analysis matrix will evolve as your research develops. As you think more deeply about the topic, your research questions, and the evidence available, the scope of the project and the need for specific analysis elements will become clearer. Treat the matrix as a working plan rather than a fixed document; it should be updated as the research process continues.

Matrix Impact on the Research Effort

The matrix gives you an architectural framework for the analytical part of your research. By laying out the major questions, analysis steps, and data needs in advance, you can better

estimate the scope of the project and identify early when the topic may need to be narrowed or adjusted. Making those decisions early can save significant time and effort later.

Using the matrix also helps create traceability between your data and your research questions. Each data element should connect to a specific analytical step, and each analytical step should help answer a secondary or primary research question. This keeps the focus on the analysis and makes data collection more purposeful, rather than allowing the project to become a broad search for any information loosely connected to the topic.

A well-developed matrix can save many hours by helping you collect the right data the first time and avoid sorting through large amounts of unrelated material. It also makes the final report easier to organize because the writing can follow the logic of the analysis plan instead of being built around a pile of disconnected data. As evidence is collected, it can be placed where it supports the analysis, improving both the logic and readability of the final research product.

Finally, the matrix helps you explain your logic to readers. As you become more knowledgeable about your topic, it can be easy to fill in gaps mentally and assume that the reasoning is obvious. Your readers may not have that same background. Mapping the logic of the project before writing helps you see where explanations are needed, so readers can follow how the evidence supports your findings, conclusions, and recommendations.

Flexibility

As your research develops and you begin collecting data, you may find opportunities to improve the project by adjusting the analysis plan, narrowing the focus, or rethinking part of the approach. Sometimes those opportunities will feel like challenges, but they are a normal part of graduate-level research. Do not hesitate to make thoughtful adjustments when needed. Learning when and how to revise the plan is part of the critical-thinking process your graduate education is intended to strengthen.

Bottom Line

If you do not plan and map out your analysis, the final report can quickly lose its logic, become buried in unnecessary detail, or ask readers to accept conclusions and recommendations without clearly showing how you arrived at them.

When you plan the analysis before collecting data, you reduce the risk of gaps in reasoning and make it easier for readers to see why your conclusions and recommendations are reasonable. A focused analysis plan also keeps unnecessary or minor data from distracting

from the main purpose of the research. In short, the plan helps you stay focused, collect the right evidence, and present a clear, persuasive argument.

1.4 Acquisition Research Program (ARP) and Deliverables

IMPORTANT! Participation in the ARP is required for Acquisition Sciences graduate students in resident programs 815 (Contract Mgmt), **816** (Program Mgmt) **or 837** (Financial Mgmt) **and distance learning programs 835** (MSA-CM) and **836** (MSA-PM)**.** To access ARP support, **you must first submit your Capstone Project Plan.**
If you have any questions, please contact Jochele Benson at arp@nps.edu.

Established in 2003, the Acquisition Research Program (ARP) advances high-quality scholarly research that informs and improves acquisition policy and practice. As a cornerstone of acquisition sciences at NPS, ARP delivers applied, warfighter-focused research, develops the next generation of defense management innovators, and connects them with thought leaders to strengthen the operational effectiveness of U.S. Naval and Joint Forces.

ARP Support

Whether working individually or as part of a team, resident students begin their capstone research by developing the **Resident Capstone Project Plan** in their third or fourth quarter, and distance learning students develop their **Distance Learning Capstone Project Plan** in the seventh quarter

To support fleet-relevant research and your professional development, ARP provides the following resources:

- **Research Topics.** Timely, relevant topics provided by sponsors.
- **Guidance.** Established processes, milestones, and resources to help you navigate the NPS research process.
- **Assistance.** A central point of contact for questions and support throughout the process.
- **Editing Support.** When needed, up to 40 billable pages of professional editing at 365 words per page.
- **Poster Support.** A template, final-formatting assistance, and printing and framing services for display at the showcase and in campus hallways.

- **Resident Students Poster Showcase.** A place to showcase completed research posters on the last day of school before graduation.
- **Printed Capstone Research Report.** A printed copy of the completed capstone research report, provided in person or by mail.

We will email you throughout the program with guidance on the research process and key milestones. Welcome aboard—we are glad you are here and look forward to supporting your capstone research.

Requirements

- **Resident Students: If you are in 815** (Contract Mgmt), **816** (Program Mgmt) **or 837** (Financial Mgmt), **you must submit the Resident Capstone Project Plan to ARP Student Project App (SPA).** Resident students complete the plan during MN4044 (Capstone Research Seminar) or MN4045 (Defense-Focused Managerial Inquiry in the third or fourth quarter.
- **Distance Learning Students: If you are in 835** (MSA-CM) and **836** (MSA-PM), **you must submit the Distance Learning Capstone Project Plan** to **ARP Student Project App (SPA)**. DL student complete the plan during MN4101 (Collaborative Problem Solving I) in the seventh quarter.
- **Produce Quality Research.** Conduct rigorous research that meets graduate-level publication standards.
- **Stay on Schedule.** Follow the established timeline and meet each milestone.
- **Complete Required Deliverables.** Submit your Capstone Project Report and **Findings Poster** to **SPA** at least one month before graduation.
- **Participate in the Showcase.** Resident students must present your research at the DAFM Student Research Poster Showcase for your graduating class, typically held on the last day of classes before graduation.

ARP Student Project App (SPA)

The **ARP Student Project App (SPA)** supports communication between ARP and students throughout the research process. It also helps ARP track ongoing research and keep sponsors informed. ARP will send you tailored emails through SPA with milestone

reminders, check-ins, and guidance on required processes. If you are enrolled in an eligible curriculum and logged in to the NPS network—on site or through the VPN—the SPA link will take you directly to the app. You will use SPA to upload your project plan, submit brief progress reports, and upload the final Word version of your capstone project report and your findings poster.

ARP TaskIt

ARP TaskIt is the online portal through which student research teams with an ARP-approved Capstone Project Plan submit draft reports for professional editing. **An approved plan is required before a team can create a TaskIt account and access editing services.** The process is as follows:

- Submit your capstone project plan to SPA per the details above.
- Create one account per research team and designate one team member to manage all submissions and identify the team's editing goals and point-of-view preferences.
- Submit the draft for review. Students and editors do not communicate directly during the review; editors provide comments and suggested revisions using tracked changes.
- Allow up to five business days for editing.
- When the review is complete, you will receive an email with a link to retrieve the edited document. The completed task will also appear on your TaskIt dashboard.

If you have any questions, please contact Jochele Benson at arp@nps.edu.

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Chapter 2: General Structure of a Capstone Project Report

Organize the capstone project report so readers can follow the problem, analysis, findings, and recommendations. Work with your advisors to tailor the structure to the research questions, methodology, and results. A typical report includes:

- Abstract
- Introduction: Problem statement and research questions
- Background
- Literature review
- Research methodology
- Analysis and results
- Summary: Answers to the research questions, conclusions, recommendations, and areas for further research
- References
- Appendices, if applicable

IMPORTANT! **Start by downloading the WORD version** of the NPS Thesis Template for Capstone Project Report. Change full-justified text formatting pre-set to left-justified (ragged right) for readability. Be consistent throughout, including block quotations.

2.1 Abstract (Executive Summary)

See How to Write an Abstract.

The abstract provides a brief, accurate overview of the capstone project and is typically completed after the report. Effective abstracts are concise (250-400 words) and specific, with limited background and no citations or process details. The abstract should clearly convey what the project examined, what the analysis found, and why the findings matter.

2.2 Introduction

The introduction provides readers with a clear overview of the capstone project, including research motivation, problem or question, methodology, connection to existing literature, and main results. It also explains why the topic matters by describing the study's contribution, organizational relevance, and institutional or policy context. Because the remaining chapters are organized around the research questions and developed with advisor input, the introduction typically closes with a brief roadmap of the report. Recent student reports in **DAIR** provide helpful examples of effective organization and content.

2.3 Background

The background section provides the institutional context readers need to understand the research problem, its significance, and the analysis. Even readers familiar with the Department of Defense may not know the relevant history, mission, goals, procedures, operating environment, or acronyms associated with the unit, occupational community, weapon system, or business system under study. Effective background sections include enough detail for a non-specialist to follow the argument without becoming an exhaustive description. After the data and results sections are complete, the background can be refined to retain the context most important to the reader.

2.4 Literature Review

A literature review examines existing research, theories, and publications to show how the capstone project fits within the broader body of knowledge. It identifies relevant concepts, methods, findings, and gaps; helps avoid duplicating earlier work; and provides a foundation for the project's theoretical or analytical framework. An effective review explains what is known, what remains unclear, and how the project contributes to the broader research conversation.

2.5 Research Methodology (Types & Methods)

The research methodology section explains the project's research approach and why it is appropriate. Research may be theoretical, focusing on concepts, models, and frameworks, or empirical, relying on observable data and evidence. Empirical studies may use quantitative methods to analyze numerical data, qualitative methods to examine non-numerical evidence such as interviews or case studies, or mixed methods that combine both approaches for a fuller understanding of the research problem. The selected methodology typically reflects the research questions, study purpose, available data, and

standards of the relevant discipline, and provides the basis for gathering, analyzing, and interpreting evidence.

2.6 Analysis and Results

The analysis and results section does more than summarize data; it uses critical thinking to explain how the evidence answers the research questions. Describe the analytical approach and how the data, methods, or other evidence were used. Discuss unsuccessful approaches only when they are relevant to the final analysis. Present the most significant findings first and reflect them consistently in the abstract, introduction, and summary. Discuss every table and figure in the text, and support empirical results with a table, figure, or clearly explained evidence. Interpret the findings, explain why they matter, and connect them to the research questions, prior literature, and organizational or policy context.

See **What is an argument?** In academic writing, an argument is a central claim or thesis supported by evidence and clear reasoning.

Also see **Writing an Argument**

2.7 Summary

The summary brings the capstone project to a clear close by answering the research questions, presenting conclusions supported by the analysis, and identifying practical recommendations. Rather than introducing new evidence, it synthesizes the key results, explains their significance to the organization or policy issue, and reconnects them to the study's purpose. When relevant, the summary also notes research limitations and areas for further study.

2.8 References and Citation Style

The approved citation style for capstone project reports is APA 7.

See **APA - Citation Guide - Research Guides at Naval Postgraduate School (NPS), Dudley Knox Library (DKL)**

The references section should include complete, accurate citations for every source cited in the capstone report and should be formatted consistently in the approved citation style.

Students are responsible for ensuring that each in-text citation has a corresponding reference-list entry and that every reference-list entry supports material actually cited in the report. References should provide enough information for readers to locate the source,

including author, date, title, publication or organization, and retrieval information when required.

Students should verify every citation against the original source, avoid relying on unverified AI-generated references, and consult the NPS APA citation guide, Dudley Knox Library, Graduate Writing Center, or their advisors when questions arise.

IMPORTANT! AI tools and APA guidance change quickly. Before beginning and again before finalizing your capstone research report, review the ***NPS Guidelines for Generative AI***, Knox Library ***Generative AI***, the ***NPS Guidance on Disclosing Generative AI Use in Academic Work***, the ***NPS APA citation guide***, and the ***Generative AI for Research and Writing Slides*** for current requirements on permitted use, citation, and disclosure.

See below for guidance and tools to avoid plagiarizing.

Plagiarism Prevention 101

Citations / Avoiding Plagiarism - Graduate Writing Center - Naval Postgraduate School

Paraphrasing and Quoting: Bulleted and Numbered Lists

Using Signal Phrases Effectively

Paraphrasing and Quoting Responsibly

Chapter 3: Capstone Project Report Administrative Process

IMPORTANT! NPS often uses "thesis" as a general term for graduate research projects, forms, systems, and administrative processes. Acquisition Sciences students complete capstone projects, but NPS processes these projects under the same requirements and procedures used for theses. When NPS guidance refers to a "thesis," it generally also applies to your capstone project unless stated otherwise.

All Acquisition Sciences Group student research reports are capstone projects. Throughout this handbook, ***capstone project*** refers to the work completed by both resident and distance learning (DL) students.

For NPS forms and the Python Thesis Dashboard, the report type must match the student's program. Resident students select **"Capstone Project"**, and **distance learning students** select **"Capstone Applied Project"**. **"Thesis" is not the correct selection** for Acquisition Sciences Group students.

Let's start with advisors.

3.1 Advisors

IMPORTANT! Your primary advisor provides the principal academic guidance throughout the capstone research process and determines whether your final report demonstrates the critical thinking and graduate-level quality required to graduate. Your second advisor, ARP, TPO, and other participants provide guidance and administrative support within their respective roles.

Each capstone project has two official advisors selected by the students from the NPS faculty. Most students work with a primary advisor and a second advisor, sometimes called a second reader. Two faculty members may instead serve as co-advisors when they share responsibility equally. The primary advisor often serves as the main point of contact, while the other advisor may provide subject-matter expertise, methodological guidance, or other support. Discussing roles and expectations early helps clarify each advisor's responsibilities.

At least **one official advisor must be a full-time DAFM faculty member**. In addition, at least **one advisor must hold a terminal degree**, such as a PhD, DBA, JD, or EdD.

Note: The advisor who holds the terminal degree may be the primary advisor, but this is not required. The requirement is satisfied as long as one member of the advising team holds a terminal degree.

Faculty from other NPS departments may serve when their expertise fits the topic, normally alongside a DAFM advisor. The **DAFM faculty directory** and **NPS faculty profiles** can help identify potential advisors.

Outside subject-matter experts from government, academia, think tanks, or industry may add practical context, technical insight, access to information, or feedback on the research. They can contribute without serving as official NPS advisors. Students considering an outside expert for an official advisor role typically discuss the arrangement with an NPS faculty advisor first.

Advisor selection is an important part of the capstone process. Conversations with several faculty members can help identify a good fit; some may prefer to review a project plan, while others may begin with a discussion of the topic. A strong advising relationship supports the project from initial planning through completion.

IMPORTANT! Seek advisor input early when completing the **Resident Capstone Project Plan** or **Distance Learning Capstone Project Plan**, as applicable. Continue consulting your advisors throughout the research process to maintain progress. See **Asking for Advisor Feedback**.

3.2 Milestones for Completing Your Capstone On-Time

The milestone tables provide recommended checkpoints for completing DAFM, Python Thesis Dashboard, ARP, and TPO requirements on time. Working backward from graduation allows time for advisor review, revisions, approvals, and unexpected delays.

Drawing on more than 20 years of experience supporting thousands of NPS students, **ARP recommends that resident students complete their capstone projects approximately two months before graduation and distance learning students approximately one month before graduation.** Early completion is especially helpful for the large June and December graduating classes. To earn your master's degree on schedule, plan ahead, communicate emerging issues to your primary advisor promptly, and avoid requesting extensions.

Note: Completing milestones ahead of the recommended timeline carries no penalty. The timeline is intended to support your progress, not create unnecessary stress. Always submit your strongest work to your advisors and for professional editing; producing high-quality, graduate-level research takes priority over meeting a recommended target date.

Resident students complete 18-month degree programs and typically begin in July or January. The table presents recommended milestones and target timelines for resident students. **"QRT. 3"** and **"QRT. 4"** indicate that MN4044 or MN4045 is taken during the third or fourth quarter of the program, respectively. **"GD"** means graduation date, and **"GD – [number] mos."** indicates the number of months remaining until graduation. **"Jun"** and **"Dec"** identify the suggested target dates, without years, for the corresponding graduating class.

RESIDENT: MILESTONES / TARGET TIMELINE	QRT. 3	QRT. 4
1. Take MN4044 (Capstone Research Seminar) or **MN4045** (Defense-Focused Managerial Inquiry)	**Grad Date (GD) – 12 mos.** Jun: Jul Dec: Jan	**Grad Date (GD) – 9 mos.** Jun: Oct Dec: Apr
• Select team members		
• Select Topic		
• Select Advisors		
• Complete NPS IRB Review		
• Resident Capstone Project Plan signed by Advisor	**GD – 11 mos.** Jun: 4 Aug Dec: 4 Feb	**GD – 8 mos.** Jun: 15 Nov Dec: 15 May
2. Python: Setup Thesis Proposal Form (TPF) in Thesis Dashboard and get advisor approval.	**GD – 11 mos.** Jun: 4 Aug Dec: 4 Feb	**GD – 8 mos.** Jun: 15 Nov Dec: 15 May
3. Required: Submit Project Plan and IRB Checklist to ARP Student Project App (SPA) and attach them to your thesis dashboard in Python.	**GD – 11 mos.** Jun: 4 Aug Dec: 4 Feb	**GD – 8 mos.** Jun: 15 Nov Dec: 15 May
4. Complete Data Collection	**GD – 8 mos.** Jun: 15 Nov Dec: 15 May	**GD – 6 mos.** Jun: 15 Jan Dec: 15 Jul

5. Finish first three chapters	**GD – 7 mos.** Jun: 15 Dec Dec: 15 Jun	**GD – 5 mos.** Jun: 15 Feb Dec: 15 Aug
6. ARP Support: Submit first three chapters to ARP TaskIt for editing (total editing per project = 40 pages). - Use editor input to improve writing quality.	**GD – 7 mos.** Jun: 15 Dec Dec: 15 Jun	**GD – 5 mos.** Jun: 15 Feb Dec: 15 Aug
7. Submit improved three chapters to Advisors. - Work with advisors until they are satisfied that the final chapters and report are complete.	**GD – 6 mos.** Jun: 15 Jan Dec: 16 Jul	**GD – 5 mos.** Jun: 25 Feb Dec: 25 Aug
8. ARP Support: Submit all chapters to ARP TaskIt for editing (remaining edited pages to reach 40 pages)	**GD – 5 mos.** Jun: 25 Feb Dec: 25 Aug	**GD – 4 mos.** Jun: 25 Mar Dec: 25 Sep
9. TPO Required: - Submit Advisor Approved Final Draft via Sharepoint. - TPO completes **iThenticate Review** and provides input. - Student fixes citations and incorporates TPO input.	**GD – 4 mos.** Jun: 25 Mar Dec: 25 Sep	**GD – 4 mos.** Jun: 25 Mar Dec: 25 Sep
10. Python: Thesis Release and Approval Form (TRAF) approved by Advisors.	**GD – 2 mos.** Jun: 15 Apr Dec: 15 Oct	**GD – 2 mos.** Jun: 15 Apr Dec: 15 Oct
11. TPO Required: Capstone/Thesis Processing Office (TPO) Brief	**GD – 2 mos.** Jun: 15 Apr Dec: 15 Oct	**GD – 2 mos.** Jun: 15 Apr Dec: 15 Oct
12. Python: TRAF approved by department and processed by TPO.	**GD – 2 mos.** Jun: 15 Apr Dec: 15 Oct	**GD – 2 mos.** Jun: 15 Apr Dec: 15 Oct
13. Required: Submit findings poster to ARP Student Project App (SPA)	**GD – 1 mo.** Jun: 1 May Dec: 15 Nov	**GD – 1 mo.** Jun: 1 May Dec: 15 Nov
14. Required: Submit approved Capstone Report to ARP Student Project App (SPA)	**GD – 2 wks** Jun: 29 May Dec: 15 Nov	**GD – 2 wks** Jun: 29 May Dec: 15 Nov

15. DAFM Required: Resident Students must participate in Graduate Student Research Poster Showcase	**Class Last Day** Jun: 11 Jun Dec: 11 Dec	**Class Last Day** Jun: 11 Jun Dec: 11 Dec
16. Graduation Date	**GD** Jun: 16 Jun Dec: 17 Dec	**GD** Jun: 16 Jun Dec: 17 Dec

Distance Learning students complete 24-month degree programs and typically begin in July. The table below presents recommended milestones and target timelines for non-resident students.

DISTANCE LEARNING: MILESTONES / TARGET TIMELINE	Due Date
1. Take MN4101 (Collaborative Problem Solving I) **QRT. 7**	**4 January**
• Select team members	
• Select Topic	
• Select Advisors	
• Complete NPS IRB Review	
• Distance Learning Capstone Project Plan signed by Advisor	**15 March**
2. Python: Setup Thesis Proposal Form (TPF) in Thesis Dashboard and get advisor approval.	**17 March**
3. Required: Submit Project Plan and IRB Checklist to ARP Student Project App (SPA) and upload them to your thesis dashboard in Python.	**20 March**
4. Finish first three chapters	**24 March**
5. Take MN4102 (Collaborative Problem Solving II) **QRT. 8**	**29 March**
6. Complete Data Collection	**1 April**
7. ARP Support: Submit first three chapters to ARP TaskIt for editing (total editing per project = 40 pages). - Use editor input to improve writing quality.	**5 April**
8. Submit improved three chapters to Advisors. - Work with advisors until they are satisfied that the final chapters and report are complete.	

9. **TPO Required:** Capstone/Thesis Processing Office (TPO) Brief	**6-8 April**
10. **ARP Support:** Submit all chapters to ARP Taskit for editing (remaining edited pages to reach 40)	**20 April**
11. **TPO Required:** - Submit Advisor Approved Final Draft via Sharepoint. - TPO completes iThenticate Review and provides input. - Student fixes citations and incorporates TPO input.	**1 May**
12. Python**: Thesis Release and Approval Form (TRAF) approved by Advisors.**	**15 May**
13. Python**:** TRAF approved by department and processed by TPO.	**20 May**
14. **Required: Submit findings** poster **and approved Capstone Report to** ARP Student Project App (SPA)	**1 June**
15. **Graduation Date**	**17 June**

3.3 Capstone Project Plan

The Resident Capstone Project Plan or Distance Learning Capstone Project Plan is a living document that establishes a shared understanding between student researchers and their advisors about the project's purpose, scope, research questions, methodology, data requirements, milestones, responsibilities, and expected outcomes. It serves as a thoughtful blueprint for organizing and managing the research effort, identifying potential feasibility or access issues early, and keeping the project aligned with graduation requirements.

All Acquisition Sciences students—resident students in programs 815, 816, and 837 and distance learning students in programs 835 and 836 —must complete a **Capstone Project Plan** that identifies their research questions, milestones, and advisors.

1. Email the first draft of your Capstone Project Plan to your advisors for review. Incorporate their feedback and continue revising the plan until your primary advisor approves and signs it.
2. Once you and your advisors agree on the revisions, **submit the approved Capstone Project Plan and IRB Checklist through the ARP Student Project App (SPA). Then upload both documents to your Thesis Dashboard in Python.**

NOTE: You must upload your project plan and IRB Checklist to both the Python Thesis Dashboard and the ARP Student Project App (SPA).
Why? Python supports official NPS capstone requirements and approvals. SPA centralizes project information so ARP can monitor projects from initiation through completion, aggregate program data, and prepare reports for accreditation reviews, research sponsors, senior-level visitors, and NPS leadership.

3.4 IMPORTANT!! Python: Set up a Thesis Dashboard

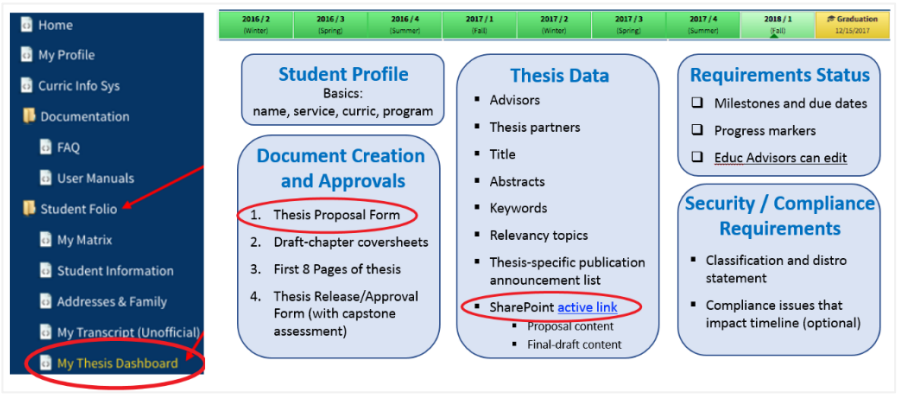
The Python Thesis Dashboard is the official NPS system for managing capstone project requirements, forms, and approvals—from HRPP/IRB review through final submission.

Students are responsible for entering, reviewing, and maintaining the required information.

Faculty, advisors, education technicians (ED Techs), the Thesis Processing Office (TPO), and other authorized personnel use the dashboard to review information and complete required actions.

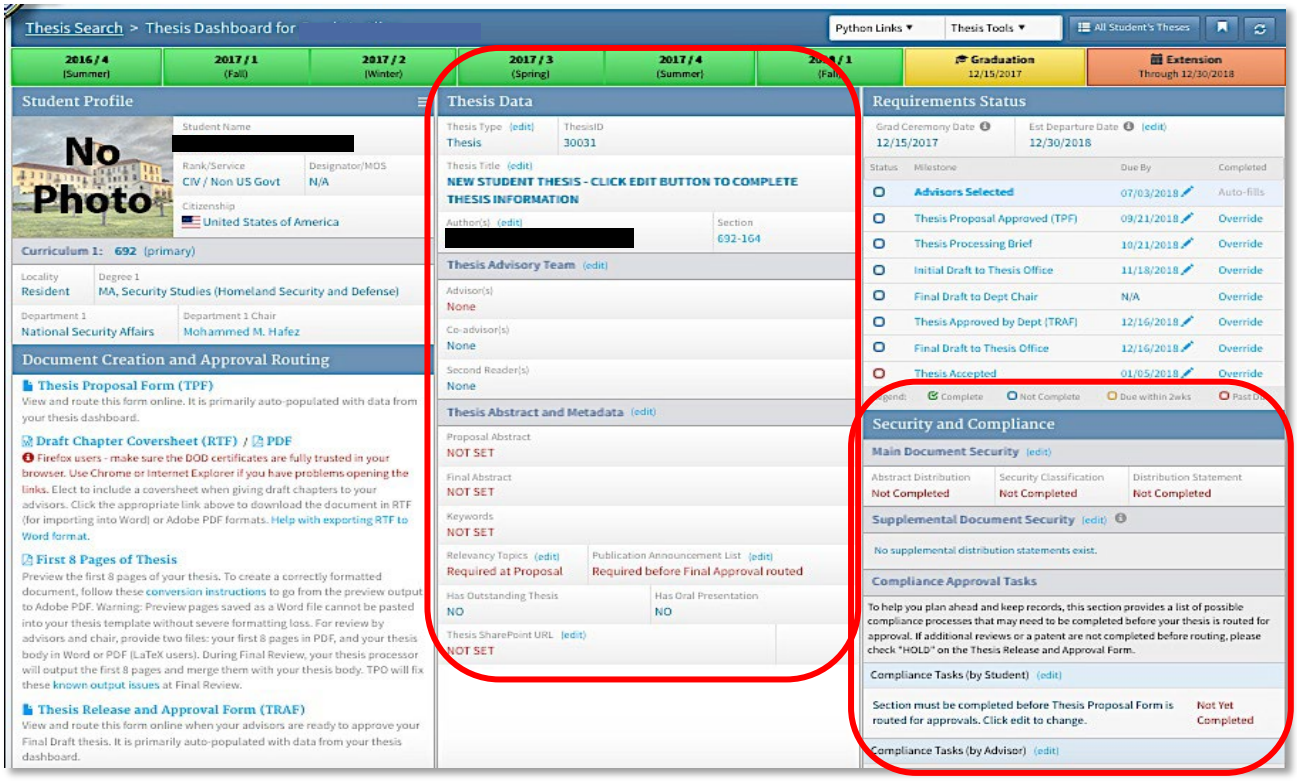
Start here!

Python / Student Folio / My Thesis Dashboard



1. **IMPORTANT!** Download the updated slides for step-by-step instructions on completing the Python Thesis Dashboard for a DAFM capstone project. The TPO slides were **updated to include DAFM-specific notes and highlighted requirements** to help you enter the information correctly.
2. **Log in to Python and open your Thesis Dashboard** (see Student Folio screenshot below). **If your Thesis Dashboard does not appear, contact your education technician (ED Tech).**

Complete the required fields in both the **Thesis Data** and **Security and Compliance** sections.



NOTE: You can edit the information in your dashboard until you route the Thesis Release and Approval Form (TRAF) during your final quarter. However, you cannot make changes while the Thesis Proposal Form (TPF) is routing for approval.

After the TPF is approved, editing permissions depend on the user's role. **DAFM academic associates** may update advisor and co-author information; **students** may update all other data; and **capstone project advisors** may update Compliance Tasks.

IMPORTANT! Both the Python Thesis Proposal Form (TPF) and the Capstone Project Plan identified above are required.

3.5 Capstone Project SharePoint Site

Unless you are writing a classified capstone project report, you will use a unique SharePoint site to share required files with the Thesis Processing Office. Your URL is automatically added to your Python Thesis Dashboard. This link will take you to the NPS SharePoint Landing page where you can find additional information. **If you have any questions, contact thesisprocessingoffice@nps.edu.**

3.6 Institutional Review Board (IRB), Surveys, and Interview Requirements

IMPORTANT! See **IRB Forms / Templates - Office of Research & Innovation - Naval Postgraduate School**

All capstone projects are screened for compliance with the **NPS Human Research Protection Program** (HRPP), also known as the Institutional Review Board (IRB) process. The screening is completed when the project is initiated in the Python Thesis Dashboard.

Projects involving people or information about people may require a HRPP/IRB determination. Examples include surveys, focus groups, direct or indirect observation of human behavior or performance, audio or video recordings, equipment testing involving people, and previously collected data containing information about individuals.

Federal regulations and DOD policy require NPS to determine whether a project qualifies as human-subject research and, when applicable, whether approval is in place before the research begins. The HRPP/IRB questions in the Python Thesis Dashboard usually begin this review. Additional information is available on the **HRPP/IRB website**.

Surveys and interviews may also be subject to separate DOD or military department and service approval requirements. The **HRPP/IRB Surveys & Interviews site** provides additional guidance.

IMPORTANT! Consult your advisor early to determine whether formal interviews, surveys, or other activities involving people are necessary to meet your research objectives. If they are required, begin planning promptly and allow sufficient time to complete the applicable IRB review and approval processes before collecting data.

3.7 Thesis Processing Office (TPO)

The **Thesis Processing Office (TPO)** establishes NPS-wide requirements, due dates, and firm deadlines for each graduating class. The **TPO brief schedule** provides briefing videos and current schedules.

IMPORTANT! Following the ARP milestones should position you to submit all completed chapters when TPO opens the three-chapter intake window. TPO treats this submission as your first official draft. Early submission is especially helpful for the typically larger June and December graduating classes and supports a more efficient review process.

The **Python Thesis Dashboard** tracks capstone paperwork, requirements, and approvals, from HRPP/IRB review through final submission. Students enter and maintain the required information. TPO training videos and guidance explain the forms and dashboard steps that accompany the report.

Early contact with TPO and regular coordination with the assigned thesis processor can help keep the review on track. Recommended submission dates support timely progress, while firm deadlines may affect graduation if missed. ARP milestones and deadlines, described above, also apply.

TPO also reviews unclassified capstone project reports before publication in the searchable **Calhoun archive** and the **Defense Acquisition & Innovation Repository (DAIR)**. Controlled Unclassified Information (CUI) and classified reports are maintained in separate repositories.

3.8 Capstone Project Report Template

IMPORTANT! Download the WORD version NPS Thesis Template for Capstone Project Report. **Change full-justified** text formatting pre-set to left-justified (ragged right) for readability. **Be consistent** throughout, including block quotations.

Capstone project reports use the same NPS template as theses. Begin writing in the template so you become familiar with its structure and automated formatting features, including the table of contents and section headings.

Before you begin, review the TPO guide, **"Common errors that we mark (you fix)."** Addressing these common issues early can reduce corrections later.

Carefully develop your **abstract and Report Documentation Page** and **keep both accurate as the report evolves**. This information will be used by repositories and discovery systems, including Calhoun, DTIC, and Google Scholar.

3.9 Writing and Editing Support

The TPO template supports consistent layout and formatting. Additional resources are available for strengthening the writing and formatting text, figures, tables, and citations.

- **Graduate Writing Center.** The **Graduate Writing Center (GWC)** offers coaching and online guidance on writing, style, and grammar.

- **ARP professional editing.** Acquisition Sciences students in programs 815, 816, 835, 836 and 837 may receive a total of up to 40 pages of professional editing at 365 words per page. **Eligibility begins after ARP approves the capstone project plan and the student commits to the prescribed milestones.**
- **Advisor preferences.** Advisors may have specific editing preferences to share before work begins. For example, expectations for active and passive voice may vary by advisor and context.
- **Approved AI tools.** DOD-approved tools, including Microsoft Copilot and the GenAI.mil suite, may provide limited editorial support for readability, concision, and grammar. The **NPS Guidelines for Generative AI** explain permitted use and disclosure requirements.
- **Citation support.** **Citing Responsibly, Avoiding Plagiarism: An NPS Refresher** provides guidance on responsible source use and APA 7 citation practices.

3.10 Submitting Capstone Report to ARP for Professional Editing

IMPORTANT! Professional editing is a limited and costly resource. Eligible students receive a total allocation of up to 40 pages at 365 words per page across all submissions for the capstone project. Submit only your strongest available work rather than an incomplete draft prepared solely to meet a milestone, so the editor can focus on meaningful improvements.

To receive professional editing support from ARP, you must meet all the following requirements:

1. **Be enrolled in an eligible program:** 815 (CM), 816 (PM), 837 (FM), 835 (MSA-CM), or 836 (MSA-PM).
2. **Complete Milestone 2:** Submit the **Resident Capstone Project Plan** or **Distance Learning Capstone Project Plan** and IRB Checklist through the ARP Student Project App (SPA).
3. **Prepare at least three consecutive chapters in the WORD version NPS Thesis Template, including all APA 7 in-text citations and a reference list.**
4. **Submit the draft through ARP TaskIt.**

ARP TaskIt is the online portal through which student research teams with an ARP-approved Capstone Project Plan submit draft reports for professional editing. **An approved plan is**

required before a team can create a TaskIt account and access editing services. The process is as follows:

- Create one account per research team and designate one team member to manage all submissions and identify the team's editing goals and point-of-view preferences.
- Submit the draft for review. Students and editors do not communicate directly during the review; editors provide comments and suggested revisions using tracked changes.
- Allow up to five business days for editing.
- When the review is complete, you will receive an email with a link to retrieve the edited document. The completed task will also appear on your TaskIt dashboard.

IMPORTANT! Eligible students approved by ARP receive a total professional-editing allocation of up to 40 pages at 365 words per page. This allocation applies to the entire capstone project, not to each submission. **For the final editing request, use the comments section of the TaskIt form to identify the chapters that need the most support**—typically the later chapters and references completed most recently.

3.11 Suggestions to Maintain Research Quality

- **Read aloud.** Hearing your writing can reveal awkward or unclear sentences.
- **Record source details.** Capture complete publication information as you research to save time when preparing the reference list.
- **Use terms consistently.** Apply the same terminology throughout the report to avoid confusion.
- **Check titles.** Ensure all figure and table titles follow program guidelines and use consistent formatting.
- **Use parallel structure.** Write items in lists and series using the same grammatical pattern.
- **Maintain verb tense.** Use consistent verb tense within and across sections unless the context requires a change.
- **Avoid second person.** Do not address the reader as "you" unless specifically permitted by your advisor or the assignment.

- **Prefer active voice.** Use active voice when it makes the sentence clearer and more direct.
- **Review organization.** Confirm that sentences, paragraphs, and sections are cohesive and arranged logically.
- **Define unfamiliar terms.** Spell out and explain a term before using its abbreviation or acronym.
- **Maintain focus.** Keep the central research topic visible throughout the report and remove material that does not support it.
- **Review citations.** Follow APA 7, introduce and contextualize sources, and explain how each quotation or reference supports the analysis.
- **Introduce sources clearly.** Identify sources by the last name of the author or editor when first discussing their work.

3.12 Plagiarism

IMPORTANT! Your advisors are here to guide and support you throughout your capstone research. If you encounter challenges at any stage, reach out to them early. They can offer practical advice to help you complete your project successfully while upholding the NPS honor code.

NPS takes plagiarism seriously. Students must properly credit every source used in their work.

What is plagiarism? Plagiarism is the use of another author's or source's words, ideas, images, or data without proper credit. Unless otherwise indicated, written work is assumed to be the author's own. Quotations, paraphrases, and summaries must be attributed to their sources.

Common knowledge, including widely accepted knowledge within a field, generally does not require citation.

The **NPS Academic Honor Code**, NPSINST 5370.4D (October 10, 2018), adopts the Naval Academy definition of plagiarism: "the use of the words, information, insights, or ideas of another without crediting that person through proper citation. Unintentional plagiarism, or sloppy scholarship, is academically unacceptable; intentional plagiarism is dishonorable. You can avoid plagiarism by fully and openly crediting all sources used."

IMPORTANT! See below for guidance and tools to avoid plagiarizing.

Plagiarism Prevention 101

Citations / Avoiding Plagiarism - Graduate Writing Center - Naval Postgraduate School

Paraphrasing and Quoting: Bulleted and Numbered Lists

Using Signal Phrases Effectively

Paraphrasing and Quoting Responsibly

3.13 Submit Capstone Project Report to TPO for Initial Review

Process Note: If you follow the ARP milestones, you may complete all chapters before TPO opens the three-chapter intake window for your graduating class. When the window opens, submit all completed chapters, even if you have more than three. **See Ready for Review.**

The chapters you submit when the intake window opens constitute your first official draft for TPO review. TPO will review the draft and provide feedback and an iThenticate report. After incorporating feedback from TPO and your advisors, submit the final draft with the Thesis Release and Approval Form. Resolve all citation and attribution issues before submitting the final draft. After final submission, uncited or improperly attributed material may be treated as plagiarism rather than as a correctable draft issue.

3.14 iThenticate Review Process

TPO runs the first official draft of each Capstone Project Report through iThenticate to identify text matches that may require closer review. The resulting report helps students, advisors, and TPO assess whether quotations, paraphrases, and citations are handled appropriately.

NPS licenses iThenticate, a Turnitin product that uses similar text-matching technology. The software compares submitted text with published and online sources and flags matching passages for review. It can help identify verbatim text that is not quoted and patchwriting that has not been adequately paraphrased.

As the NPS office responsible for publishing capstone reports and theses, the Thesis Processing Office (TPO) works within available resources to ensure publications do not knowingly contain plagiarized material or personally identifiable information (PII). TPO also verifies that manuscripts meet copyediting and formatting standards, include required

signatures, display the faculty-designated distribution statement, and document permission to use copyrighted material.

iThenticate helps reviewers:

- Identify verbatim material that is not properly quoted.
- Identify incomplete or overly close paraphrasing.
- Support instruction on proper citation, quotation, paraphrasing, and documentation while manuscripts are still in draft form.
- Students returning to academic study may need to refresh their understanding of citation practices. All NPS students remain responsible for submitting coursework and capstone reports that are free of intentional and unintentional plagiarism.

3.15 Required Capstone Project Poster

The findings poster provides a concise visual summary of your capstone project report. It should include the abstract, methodology, key results and findings, potential areas for future research, and an impact statement. **Follow this link to access the poster template**. ARP will support students throughout the process and will print and frame each poster for display at the Poster Showcase and in the hallways of Ingersoll Hall.

3.16 Graduate Student Research Poster Showcase

Each quarter, ARP hosts the Graduate Student Research Poster Showcase for graduating DAFM students. Resident students present their research posters at the showcase, typically held on the last day of classes before graduation, and share their findings with NPS senior leadership, faculty, classmates, family members, and visiting service leaders. Posters from resident and distance learning students are displayed at the graduation social and afterward in the hallways of Ingersoll Hall.

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Chapter 4: Topic, Research Questions and Methodology

4.1 Identifying an Area of Interest

Research topics often emerge from professional experience, academic work, current defense priorities, and conversations with others. The following sources may help identify a topic that is relevant, feasible, and engaging:

- **Professional experience and goals.** Challenges from previous commands, fleet assignments, or future positions may suggest useful research questions. Former or future commanding officers, points of contact, and colleagues may also offer ideas.
- **Defense Acquisition & Innovation Repository (DAIR).** DAIR includes research papers, symposium presentations, and student reports on acquisition, contracting, program management, logistics, technology transition, and related fields.
- **Acquisition Research Program (ARP).** The ARP Student Program page lists acquisition sciences sponsored topics submitted by sponsors. Presentations and discussions at the annual Acquisition Research Symposium & Innovation Summit may also generate ideas.
- **Coursework.** Courses introduce operational challenges, case studies, research methods, and analytical tools that may point toward topics that align with a student's interests and goals.
- **NPS faculty.** Faculty research may offer potential capstone topics or opportunities to support a larger project. Relevant work and expertise can be explored through Calhoun, the DAFM faculty directory, and NPS faculty profiles.
- **NPS events and visitors.** Workshops, lectures, and conferences with Navy, DOD, industry, government, and academic partners highlight current problems and emerging areas of interest.
- **Naval Research Program (NRP).** Funded by SECNAV, NRP supports research for the Navy and Marine Corps. The NRP Topic Portal provides examples of current Navy research priorities.
- **Library research guides.** The NPS Library Research Guides provide starting points for acquisition and other research areas.

4.2 Refining Your Research Topic

Most research topics begin broadly and become more focused through several rounds of refinement. As the project develops, a workable topic usually becomes clear.

Refinement is a normal part of research planning. Changes in scope often reflect a better understanding of the available time, evidence, access, and analytical effort. Advisors can help determine whether the topic is focused enough to meet graduation requirements and be completed within the capstone timeline.

A useful topic is relevant, researchable, and feasible. The following questions may help refine the scope:

- **Purpose and relevance.** What specific problem, decision, capability, or policy issue will the research address, and who would benefit from the answer?
- **Evidence.** What evidence would support a credible answer, and is it available, reliable, and accessible within the project timeline?
- **Analysis.** What analytical approach could answer the question, and does it fit the student's skills, available tools, and advisor expertise?
- **Feasibility.** Can the work be completed within the available time including approvals, data collection, analysis, writing, and revisions?
- **Access and approvals.** Does the project depend on organizations, systems, proprietary information, CUI, surveys, interviews, or human-subject review that may affect access or timing?
- **Contribution.** Will the project add useful knowledge, assess an unresolved issue, compare alternatives, evaluate a policy or process, or apply an established method in a new context?

4.3 Developing Your Research Questions

IMPORTANT! The NPS Graduate Writing Center research-question guide offers additional examples, a refinement checklist, and a short video series.

Primary and secondary research questions guide the analysis plan, methodology, evidence collection, and organization of the final report. The primary question captures the central issue the project will address. Secondary questions divide that issue into the major components needed to reach a complete, well-supported answer.

Research questions typically develop through several iterations. Wording may become more precise, scope may narrow, and questions may be added, combined, or removed as the literature, available evidence, methodology, and project constraints become clearer. Advisor feedback is an important part of this process.

Developing a Primary Research Question. A useful starting point is the specific problem, decision, capability, policy, or knowledge gap identified during topic refinement. The primary question can then frame what the project seeks to understand, evaluate, compare, explain, or improve. Strong primary questions are open-ended, focused, neutral, and answerable through analysis rather than a simple yes-or-no response.

Developing Secondary Research Questions. Secondary questions identify the major lines of analysis needed to answer the primary question. Depending on the project, they may address the current condition, evaluation criteria, contributing factors, stakeholder perspectives, costs and benefits, alternatives, implementation challenges, or expected effects. Each secondary question should make a distinct contribution to the primary answer.

Research Question Checklist

- **Clear.** Does the question state exactly what the project seeks to determine?
- **Focused.** Is the scope appropriate for the available time?
- **Significant.** Would answering the question provide useful knowledge or support a meaningful decision?
- **Researchable.** Is suitable evidence available and accessible?
- **Analytical.** Does the question require interpretation, comparison, evaluation, or explanation rather than description alone?
- **Neutral.** Is the wording free of assumptions about the expected answer?
- **Aligned.** Do the secondary questions, methodology, and evidence support the primary question?

4.4 Identify Methodology

Theoretical v. Empirical Research

The first broad categorization of research methods generally classifies work as either theoretical or empirical.

Theoretical research focuses on developing or refining concepts, models, and frameworks through logical reasoning and abstract thinking. It aims to build or test theories without necessarily collecting new data.

Empirical research involves systematic observation and data collection from the real world to test hypotheses or answer questions. It relies on evidence gathered through experiments, surveys, observations, or other measurable methods.

The key difference is that theoretical research works with ideas and logic, while empirical research works with observable data and evidence.

Quantitative, Qualitative, and Mixed Methods Research

Research methods can be broadly categorized into three main types: Quantitative, Qualitative, and Mixed Methods. Each type serves different purposes depending on the research objectives.

Quantitative Research answers questions by analyzing numerical data. This involves testing hypotheses through measurable variables and data analysis, often employing statistical techniques to establish cause-and-effect relationships. Examples of quantitative research methodologies include the following:

- Multiple Regression Analysis, Factor Analysis, and Structural Equation Modeling
- Time Series Analysis
- Experimental and Quasi Experimental Designs
- Optimization and Operations Research Methods
- Cost benefit and cost effectiveness analysis for policy evaluation.
- Network analysis for organizational or intergovernmental relationships.

Qualitative Research focuses on understanding human behavior, experiences, and social phenomena through non-numerical data. These data are typically collected through focus groups, individual interviews, ethnography, content analysis, and other techniques. Qualitative research often addresses exploratory questions and can reveal underlying mechanisms or perspectives that may not be captured through quantitative analysis. Examples of qualitative and applied analytical methods include the following:

- Case studies
- Capability gap assessment
- Analysis of alternatives
- DOTmLPF-P assessment
- Cause and Effect analysis
- Root cause analysis
- Decision Matrices
- Cost Effectiveness analysis

Mixed Methods Research combines both qualitative and quantitative methods to provide a comprehensive understanding of the research problem. For example, the researcher might use the qualitative portion of the work to establish the conceptual framework and formulate the hypotheses for the subsequent quantitative portion of the capstone project.

Choosing the right research method is crucial for the success of any project, as it determines how data is gathered and interpreted. Researchers must consider the nature of their study, the purpose of the study, and the discipline they are working with when selecting a method.

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Chapter 5: Conducting a Literature Review

5.1 Purpose of a Literature Review

A literature review examines and synthesizes existing research, theories, and credible publications related to your topic. After refining your research questions and selecting a methodology, use the review to determine what is already known, how earlier researchers approached the topic, where findings agree or differ, and what questions remain unresolved. Work through the process in stages: define the scope, develop a search strategy, locate and screen sources, evaluate the strongest evidence, organize your notes, synthesize patterns across the literature, and revise the review as the project develops. A well-developed review helps you avoid duplicating earlier work, clarify important concepts and methods, refine your research questions, support your analytical framework, and explain how your project will contribute useful knowledge.

5.2 Warning Large Language Models (LLMs) Use

Do not use LLMs to write ANY of your capstone project chapters!

Some students have used large language models (LLMs), such as ChatGPT, Claude, and Copilot, to draft literature reviews or other portions of their capstone projects. The most serious NPS academic honor code concerns involving AI-generated writing have frequently arisen in literature reviews, where inaccurate synthesis, fabricated sources, and unattributed content can be difficult to identify.

IMPORTANT! AI tools and related guidance change quickly. Before beginning and again before finalizing your capstone research report, review the ***NPS Guidelines for Generative AI***, Knox Library ***Generative AI***, the ***NPS Guidance on Disclosing Generative AI Use in Academic Work***, the ***NPS APA citation guide***, and the ***Generative AI for Research and Writing Slides*** for current requirements on permitted use, citation, and disclosure.

Using an LLM to generate substantive capstone content violates the NPS academic honor code. An undisclosed violation may jeopardize your degree and career. Advisors are obligated to report suspected violations to the honor board and may discuss concerns with you or review the draft using available tools. Because detection methods continue to improve, a capstone may also be reviewed after graduation, requiring you to address concerns later.

LLMs are unreliable tools for identifying published articles and reports. They may fabricate authors, citations, report titles, numbers, or URLs, or link to unrelated material. Treat every AI-suggested reference as unverified until you locate and review the original source. Do not use an LLM to generate substantive capstone content. When current NPS guidance and your advisor permit it, an approved tool may provide limited editorial support, such as identifying typographical or grammatical errors or suggesting revisions for clarity or active voice. Review every suggestion, remain responsible for the final text, and disclose AI use as required. Consult your advisor before using AI for coding and follow all applicable guidance.

IMPORTANT! Your advisors are here to guide and support you throughout your capstone research. If you encounter challenges at any stage, reach out to them early. They can offer practical advice to help you complete your project successfully while upholding the NPS honor code.

5.3 Evaluating Research Articles

A strong literature review does more than summarize sources. It explains how the studies relate to one another and evaluates the quality and usefulness of their evidence. For each source, identify the question or problem examined, the method and data used, the principal findings, and the study's strengths and limitations. Then compare those elements across sources to determine what the literature establishes, where findings conflict, and what remains unanswered.

Begin with a focused group of sources that represents the major concepts in your research questions. Eight to ten well-chosen sources may provide an initial orientation, but the number itself does not determine quality or completeness. Use this first group to learn the terminology, identify leading researchers and organizations, locate foundational work, and refine your search. Follow useful reference lists to earlier studies and cited-by links to newer work. Continue searching until additional sources largely repeat the concepts, methods, findings, and perspectives already represented. Because the appropriate scope varies by topic, consult your advisor about essential sources and whether the review is sufficiently comprehensive.

- **Record the source.** Save the complete citation and note the research question or purpose, context, framework, methodology, sample or cases, data or evidence, analytical approach, findings, limitations, and relevance to your project. Clearly distinguish the author's claims from your observations, identify exact quotations, and record page numbers for quotations and detailed paraphrases.

- **Evaluate the argument.** Identify the main claim and trace the reasoning from evidence to conclusion. Ask whether the study answers the question it poses, states its assumptions, considers plausible alternative explanations, and limits its conclusions to what the evidence supports.
- **Evaluate the methodology.** Determine whether the research design is appropriate for the question. Examine how participants, cases, documents, or observations were selected; whether comparison groups or benchmarks are suitable; whether procedures are explained clearly enough to evaluate; and whether the analytical method is applied appropriately.
- **Evaluate the source's credibility.** Consider the author's qualifications, the reputation and purpose of the publication or sponsoring organization, the review or editorial process, the date, potential bias or conflicts of interest, and the transparency of the methods and limitations. Peer review can strengthen confidence in a source, but it does not replace your own evaluation.
    1. **Map causal claims.** If a source claims that one factor causes another, identify the proposed cause, the mechanism connecting cause and effect, the expected outcome, and other factors that could produce the same result. A simple logic model or flowchart can make the argument easier to test. Check whether the variables, comparisons, sequence of events, and evidence support every link in the chain rather than merely showing an association.
    2. **Assess relevance and applicability.** Decide how directly the source informs your research questions and setting. Differences in military service, organization, population, mission, policy environment, technology, location, or time period may limit transferability. A source may be credible but only marginally relevant, or highly relevant but methodologically weak.
- **Evaluate quantitative evidence.** Review how variables are defined and measured, where the data originated, how missing or incomplete data were handled, and whether the sample and time period fit the research question. Consider whether the analytical method and comparison are appropriate, whether the results are sensitive to key assumptions or alternative specifications, and whether statistical results are also meaningful in practical terms.
- **Evaluate qualitative evidence.** Review how participants, cases, documents, or observations were selected; whether data-collection, coding, and interpretation procedures are explained; whether conclusions are supported by sufficient evidence;

whether contrary or disconfirming evidence is addressed; and what steps were taken to strengthen credibility and reduce researcher bias.

- **Compare sources systematically.** Transfer the same information from each source into a literature matrix with columns for the question, context, method, evidence, findings, limitations, and relevance. Read across the matrix to identify agreements, disagreements, recurring limitations, changes over time, and gaps. These patterns—not a sequence of isolated source summaries—provide the foundation for organizing and writing the literature review.

5.4 Background or Policy Context

- **Purpose and Placement.** Background or policy context may accompany the literature review, but the two serve different purposes. The literature review evaluates and synthesizes prior research; the background section explains the institutional, operational, historical, technical, or policy setting readers need to understand the research problem and later analysis. Depending on the report's organization and advisor guidance, this material may appear in a separate background chapter or in a clearly identified part of the literature review.
- **Identify the Context Readers Need.** Assume that readers understand the Department of Defense broadly but may not know the specific organization, occupational community, program, weapon or business system, policy, or process examined in the capstone. Include the context needed to explain why the problem matters and how the system operates. This may include the organization's mission and responsibilities; relevant history or policy changes; key authorities, requirements, and decision points; roles of major stakeholders; important procedures or timelines; the operational environment; and definitions of specialized terms and acronyms.
- **Decide What to Include.** Use the research questions and analysis plan to decide what belongs. For each proposed background detail, ask whether readers need it to understand the problem, interpret the evidence, follow the methodology, or evaluate the findings. If the information does not support one of those tasks, shorten it, move it to an appendix, or omit it. Support factual statements about policies, organizations, processes, and historical events with authoritative sources, and distinguish current requirements from earlier versions when changes over time affect the analysis.
- **Defense Acquisition Example.** For example, a study examining cost growth in a defense acquisition program may need to explain the capability requirement, acquisition pathway and program phase, major decision points, contracting approach, funding

structure, program office and contractor responsibilities, baseline cost and schedule, and significant requirement or technical changes. It would not require a complete history of the Defense Acquisition System. Present the context in the order readers will need it, moving from the broader acquisition policy and organizational setting to the specific program, process, or decision examined in the research.

- **Revise the Background as the Report Develops.** Treat the background as a working section. After drafting the methodology, analysis, and results, return to it and check each paragraph against the final report. Add context needed to explain an important finding, remove material that the analysis never uses, update terminology and policy references, and confirm that acronyms are defined when first introduced. The finished section should provide enough context for a non-specialist to follow the argument without becoming an exhaustive description of the organization or system.

5.5 Putting Together Your Literature Review

After completing the initial reading, evaluation, and note-taking, turn the source notes into an explanation of the state of knowledge on the topic. The literature review should show what the body of research establishes, where findings or approaches differ, what remains uncertain, and how those patterns inform the research questions and planned analysis. Organize the discussion around ideas and relationships—not around the order in which the sources were found.

- **Identify patterns across sources.** Review the literature matrix, concept map, or source notes and group studies that address the same concepts, questions, findings, methods, populations, programs, or policy issues. Mark areas of agreement and disagreement, recurring limitations, changes over time, competing explanations, and questions that remain unresolved. A proposed theme should be supported by several sources and should help explain the research problem; if it does not, combine it with another theme or omit it.

- **Choose an organizing structure.** Select the structure that best supports the purpose of the review and makes the relationships among sources clear. A thematic structure groups research by recurring issues or concepts; a chronological structure traces how knowledge, policy, or practice changed over time; a methodological structure compares how different research designs or data sources shaped the findings; and a theoretical or conceptual structure organizes the discussion around competing frameworks or explanations. Many reviews combine approaches—for example, using themes as the main sections and discussing developments over time within each theme.

- **Build an outline before drafting.** Begin with a short introduction that defines the topic, purpose, scope, and organizing logic of the review. In the body, create a heading for each major theme or analytical grouping and list the claims, sources, points of comparison, and unresolved issues that belong under it. Arrange the sections so each one builds toward the research problem. End with a conclusion that states what the literature establishes, identifies the most important limitations or gaps, and connects those gaps to the capstone's research questions and methodology.
- **Draft synthesis paragraphs.** Begin each paragraph with a claim about the literature rather than an author's name. Bring together evidence from several sources that supports, qualifies, or challenges that claim. Explain why studies agree or differ by considering their methods, data, assumptions, time periods, populations, or organizational contexts. Close the paragraph by stating what the combined evidence means for the research question or analytical approach. If a paragraph discusses only one source, determine whether the detail is necessary or whether it should be combined with related work.
- **Explain the project's contribution.** Conclude by stating what the literature establishes, what remains unresolved, and which part of that gap the capstone will address. The contribution may come from new or updated data, a different method, a new military service or organizational context, a comparison not previously made, the application of an established method to a new acquisition problem, or changes in policy, technology, or operating conditions. Link the contribution directly to the research questions and planned analysis so readers can see why the project is relevant and what it may add.
- **Revise for coherence and completeness.** Check that every section supports a research question, each paragraph compares or interprets sources, and transitions explain how one theme leads to the next. Remove source-by-source summaries, unsupported claims, and background that does not help readers interpret the literature. Confirm that major perspectives are represented, disagreements and limitations are acknowledged, citations match the reference list, and the conclusion accurately reflects the evidence discussed in the review.

5.6 Finding Research Articles

- **Build a Search Plan.** Start by turning each research question into a search plan. List the central concepts, then add synonyms, acronyms, program and organization names, policy terms, controlled vocabulary, and broader or narrower alternatives. Use database filters, Boolean operators, phrase searching, subject headings, and date or document-type limits to improve the results. Search several discovery systems because no single database covers every journal, government report, thesis, conference paper, or acquisition publication.
- **Use AI and Technology Responsibly.** Use technology to accelerate discovery without allowing it to replace scholarly judgment. AI-enabled search and research tools may help generate alternative keywords, translate a plain-language question into database queries, cluster results by theme, identify related works, or summarize abstracts for preliminary screening when that use is permitted by NPS and your advisors. Treat AI output as leads rather than evidence: open the original source, confirm that it exists, verify the author, title, date, report number, and publication venue, and read the relevant sections before citing or relying on it. Do not cite an AI system as the source of factual information, and never enter controlled, proprietary, personal, export-controlled, or other sensitive information into an unapproved tool.
- **Search Authoritative Research Sources.** Begin with the **Dudley Knox Library** portal and its research guides, databases list, library search, NPS theses and capstone reports, and government-information resources. For acquisition topics, also search the **Defense Acquisition & Innovation Repository (DAIR)**; for broader NPS scholarship, search **Calhoun**. **Google Scholar** can supplement these systems and is especially useful for cited-by searching, related-article discovery, and finding alternative versions of a source, but confirm access and publication details through the library or the publisher.
- **Screen, Save, and Track Sources.** Screen results in stages. Review titles, abstracts, keywords, and publication information first; save the most promising sources to a citation manager or structured research workspace; then read the full text and record why each source was included or excluded. When you find a strong source, work backward through its reference list and forward through cited-by links to identify foundational and newer research. Use author profiles, journal alerts, saved database searches, and repository notifications when available to monitor new publications while the capstone is underway.
- **Document the Search Process.** Keep a digital search log that records the database or tool, exact search string or prompt, filters, date searched, number and quality of results,

and useful sources. Update the log as the terminology and research questions become more precise. This record helps you reproduce the search, avoid repeating unsuccessful queries, explain the scope of the review, and identify where coverage may still be weak.

- **Work with DKL Librarians.** Use DKL librarians as research partners, especially when searches return too much, too little, or only familiar material. Library liaisons can recommend specialized databases, help build and test search strategies, locate difficult government or technical sources, and identify options for obtaining material that is not immediately available. Consult the current **DKL directory** for the liaison serving DAFM rather than relying on a named contact that may change.

Chapter 6: Planning Your Data Collection

Chapter 1, "Overview—Planning for an Analysis-Centered Capstone Research Report," introduced the Analysis Planning Matrix Method as a tool for planning data collection, defining an efficient project scope, and supporting a successful research effort. This chapter applies the method to a practical use case.

IMPORTANT! Reliable, high-quality data are essential to your success. Use the analysis planning matrix to assess potential topics and determine whether the data needed to answer your research questions are available and accessible. If you cannot secure the necessary data, refine the project scope, revise the research questions, or select another topic. Evaluating a topic with the matrix before committing to it can prevent substantial rework later. **ARP has sponsored research topics for your consideration.**

6.1 Data Collection Supports Analysis

A graduate-level capstone demonstrates critical thinking through analysis; data collection supports that analysis, not the other way around. Before collecting data, consult your advisors on the most appropriate quantitative, qualitative, or mixed-methods approach. Then identify the numerical, textual, visual, or other evidence needed to answer your research questions clearly and persuasively. The analysis planning matrix will help connect each question to the required analysis and supporting data.

6.2 Analysis Planning Matrix

Research questions provide the foundation for the analysis planning matrix. The matrix connects each question to the analysis and evidence needed to answer it. A reader-focused approach helps identify the information and reasoning needed to support a complete, credible answer.

The matrix includes three elements: secondary research questions, required analysis, and supporting data.

Developing the matrix before data collection keeps the analysis at the center of the project and helps focus collection on the evidence that matters.

The following example examines the Army's use of chemical agent resistant coating (CARC) on tactical wheeled vehicles.

Primary research question: Is the U.S. Army achieving the intended benefits of its policy requiring CARC on all tactical wheeled vehicles?

Secondary research questions address the major components needed to answer the primary question. They reflect the information readers need to understand and the analysis the researcher needs to present. For this example, the secondary questions are:

- What are the Army's goals for tactical wheeled vehicle coatings?
- How does CARC support chemical-agent decontamination of tactical wheeled vehicles?
- What alternative coatings are viable for Army tactical wheeled vehicles?
- What are the relative advantages and disadvantages of CARC and the viable alternatives?

Table 1 below shows how the matrix connects each secondary question to the analysis and data needed to support the primary research question.

Table 1

Research Question	Analysis Needed	Data Needed
What are the desired Army goals for tactical wheeled vehicle (TWV) coatings?	• Substrate protection • Chemical agent resistance • Camouflage • Maintainability • Cost effectiveness	• Corrosion & environment protection performance spec & test/operational perf data • Absorption rates, decontamination (decon) performance, & post-decon performance requirements & test/operational data • Detectability performance specifications & degradation testing/performance • Req maintenance actions frequency, costs, & safety implications data • Initial coating & maintenance TOC
How does CARC help facilitate the Army's decontamination efforts on TWVs?	• Decon operational scenarios • Specified absorption resistance & decon effectiveness (unprotected soldier-exposure guidelines) • Decon procedure scenarios • Non-CARC component decon (tires, seats, plastics, etc.)	• Decon TWV test/operational data • Pre-decontamination absorption rate data & post-decontamination (off-gassing) exposure performance data • CARC operational decon procedure data • Non-CARC TWV item chemical resistance & decon effectiveness data

What alternative coatings would be viable for Army TWVs?	• Commonly used automotive coatings • Alternate coating viability for substrate protection, chem agent resistance, camouflage, maintainability, & cost effectiveness	• Automotive coatings data • Perf data addressing Army goals for TWV coatings (as in block two above)
What are the relative advantages & disadvantages of CARC and the viable alternatives?	• SWOT analysis • Sensitivity analysis to Army goal prioritization •	• Data collected above • Army-perceived or Army-specified coatings' performance priorities (may be derived)

Your analysis planning matrix will evolve as your research progresses. As the project develops, the scope and required analytical elements will become clearer. Treat the matrix as a working document and update it as needed.

6.3 How the Analysis Planning Matrix Improves the Research Process

- **Project Scope.** The matrix clarifies the project's scope and helps identify early when the focus should be narrowed or adjusted, saving significant time and effort later.
- **Efficiency.** The matrix links each data element to an analytical step and each step to a research question. This traceability keeps data collection focused on the evidence needed for the analysis, reducing time spent gathering and sorting through loosely related information.
- **Organization.** Organizing research around the analysis plan—rather than unrelated data—improves the report's structure, logic, and readability by placing evidence where it directly supports the analysis.
- **Logic.** The matrix maps the project's reasoning before writing, helping you identify gaps that may be clear to you but not to readers. Planning the sequence in advance makes it easier to explain how the evidence supports your findings, conclusions, and recommendations.
- **Flexibility.** As research and data collection progress, adjust the analysis plan or refine the focus when needed. Thoughtful adaptation is an important part of graduate-level critical thinking.

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Chapter 7: Presenting Your Results

7.1 Introduction to Tables and Figures

Tables and figures help readers understand evidence quickly by organizing comparisons, trends, relationships, processes, and complex information visually. Use them when a visual display communicates the information more clearly or efficiently than text alone. Do not add a table or figure merely to decorate the report, repeat information already explained, or avoid interpreting the results.

Choose the Best Format

- **Use a table** when readers need to compare exact numerical values or concise text arranged in rows and columns.
- **Use a figure** for any visual display that is not a table, including graphs, charts, maps, photographs, diagrams, flowcharts, plots, and other illustrations. Figures are especially useful for showing patterns, trends, relationships, sequences, or spatial information.
- **Use text** when the information is brief, simple, or more easily understood in one or two sentences. A small set of values or a straightforward finding may not require a separate visual.

Design for the Reader

Every table and figure should serve a clear analytical purpose, support a point discussed in the text, and be understandable without requiring readers to search elsewhere for basic meaning. Introduce each visual before it appears, identify the finding or comparison readers should notice, and explain its significance in the surrounding text. The text should interpret the visual rather than repeat every entry or data point.

Follow APA 7 and NPS Requirements

Format tables and figures consistently with APA 7 and the current NPS Thesis Processing Office template. APA 7 establishes the general conventions for numbering, titles, labels, notes, and source attribution; the NPS template provides the required styles, placement, and automated list formatting for capstone reports. When the requirements differ, follow

current NPS and TPO guidance and consult your thesis processor or advisor. The sections that follow explain how to select, introduce, format, cite, and review tables and figures.

7.2 General Guidelines for Tables and Figures

Classify and Number Visuals Correctly

- **Table.** Use this label when information is organized in rows and columns.
- **Figure.** Use this label for every other visual display, including graphs, charts, maps, photographs, diagrams, flowcharts, plots, and illustrations.
- **Numbering.** Number tables and figures separately in the order they are first mentioned in the text: Table 1, Table 2, Figure 1, Figure 2, and so forth. Do not add letters such as "Figure 3b" unless several related panels are intentionally combined within one numbered figure.

Refer to Every Table and Figure in the Text

Mention every table and figure before it appears. Use the full word *Table* or *Figure*, capitalize it when referring to a specific numbered visual, and include the number. Tell readers what to notice or why the information matters; do not merely direct them to look at the visual.

- **Correct:** "Table 2 compares the estimated costs of the three alternatives."
- **Correct:** "As shown in Figure 1, schedule growth increased after the baseline revision."
- **Correct:** "The results are summarized in a table."
- **Incorrect:** "See Fig. 1."
- **Incorrect:** "The table below shows the results."
- **Incorrect:** "As shown in table 2 …"

Avoid directional references such as *above*, *below*, *preceding*, and *following*. Pagination and placement may change during editing, but the table or figure number remains accurate.

Make Each Visual Understandable on Its Own

A reader should be able to understand the basic purpose and content of a table or figure without returning to the surrounding paragraphs. Give it a clear number and descriptive title; label rows, columns, axes, units, categories, symbols, and legends; define unfamiliar abbreviations; and provide enough context to interpret the values or image. The narrative should still explain the principal finding and its relevance to the research question.

Review the Final Visual

Proofread the visual itself—not only the text around it—for spelling, grammar, capitalization, number formatting, labels, units, legends, citation information, and consistency with the report. Confirm that text remains legible at the final page size and that colors, patterns, and symbols can be distinguished when printed or viewed by readers with color-vision limitations. When a visual is created in software other than Word, correct errors in the source file and re-export the final version; an editor may not be able to revise text embedded in an image.

Use Notes When Readers Need Additional Information

Place notes directly beneath the table or figure. Use a general note introduced by italicized *Note*. to define abbreviations, explain units, identify missing data, describe a method or modification, or provide source and copyright attribution. Use specific notes or probability notes only when needed. Keep the title brief; move detailed explanations to the note rather than placing them in the title.

7.3 Citing Tables and Figures

The citation and attribution required for a table or figure depend on whether the visual is original, adapted, or reproduced. In all cases, the source information must be accurate, and every cited source must have a corresponding reference-list entry.

Original Tables and Figures

A table or figure created entirely from your own analysis generally does not require a citation. If it displays data collected by another person or organization, cite the data source even though you created the visual. If the visual was included in your own previously published work, cite that publication and consult your advisor or thesis processor about any reuse or copyright requirements.

Adapted Tables and Figures

An adapted visual changes the original presentation, content, labels, scale, organization, or design. Place a general note beneath the visual that begins with italicized *Note*. and identifies it as adapted from the source. Include the author or organization, year, title, publication information, and a page, table, figure, section, or paragraph locator when one is available. Briefly describe substantial modifications when readers need that information to interpret the visual.

> *Note.* Adapted from [Title of Work], by A. A. Author, Year, Publisher or Journal, page or figure number, URL or DOI. Copyright Year by Copyright Holder.

Reproduced Tables and Figures

A reproduced visual is copied without substantive change. Use a general note beginning with italicized *Note*. and identify the source with *From* rather than *Adapted from*. Include the same publication and locator information used for an adapted visual.

> *Note.* From [Title of Work], by A. A. Author, Year, Publisher or Journal, page or figure number, URL or DOI. Copyright Year by Copyright Holder.

Copyright and Permissions

Citation and permission are separate requirements. A citation gives credit to the source; it does not automatically authorize reuse. Determine whether the visual is in the public domain, covered by a license, permitted under an applicable use exception, or requires written permission. Include the copyright or license statement required by the source. Because NPS capstone reports are publicly available, consult the current NPS, TPO, and library guidance when the reuse status is unclear.

Complete the Reference Entry

Include the source in the reference list and use an in-text citation when discussing it in the narrative. Page numbers are required for direct quotations and helpful for locating a reproduced or adapted visual, but they may be unavailable for webpages or other unpaginated sources. In those cases, use another precise locator when available. Do not rely on a parenthetical citation alone beneath the visual when a full APA attribution note is required.

7.4 Effective Titles for Tables and Figures

A strong title allows readers to identify the subject and purpose of a table or figure quickly. Write the title after the visual is complete so it accurately reflects the information shown.

Write a Brief, Descriptive Title

- **Name the content.** Identify the variables, comparison, population, program, location, or time period needed to distinguish the visual from others in the report.
- **Keep the title focused.** Include essential context, but move methods, definitions, source information, exceptions, and lengthy qualifications to a note beneath the visual.
- **Use title case.** Capitalize the first and last words and all major words in accordance with APA 7. Format the title using the current NPS/TPO table-title or figure-title style.
- **Limit abbreviations.** Spell out unfamiliar or specialized terms. Retain only abbreviations readers are expected to recognize or that have been established clearly in the report and visual.
- **Use "vs." only when appropriate.** The lowercase abbreviation may appear in a concise comparison title, heading, or label, but a descriptive phrase such as "Comparison of" may be clearer.

Test the Level of Detail

- **Too general:** *Analysis*
- **Too detailed:** *Analysis of Experiment 1 Results Collected in 2002, 2003, and 2004 and Compared With Experiment 2*
- **Effective:** *Experiment 1 Results, 2002–2004*

Move Supporting Details to a Note

Place a note directly beneath the table or figure—not as a footnote at the bottom of the page—when readers need definitions, units, exclusions, data-quality limitations, methodological details, explanations of symbols, or source and copyright information. Begin a general note with italicized *Note.* Include only information needed to understand or use the visual.

7.5 Creating Useful Tables

Use a table when readers need to compare exact values or concise text arranged in rows and columns. A table should make the information easier to scan, compare, and interpret than prose would. If the information can be stated clearly in one or two sentences, use text instead.

Plan the Table Before Formatting It

- **Define the purpose.** Write one sentence stating the comparison or finding the table should communicate.
- **Select essential content.** Include only the rows, columns, statistics, and explanatory text needed to support the purpose. Move secondary detail to an appendix when appropriate.
- **Arrange comparisons deliberately.** Place items readers should compare next to one another. Order categories logically—for example, chronologically, by importance, alphabetically, or from highest to lowest.
- **Choose the orientation.** Put the organizing categories in the leftmost column and the values or attributes being compared in the remaining columns. Avoid layouts that force readers to scan back and forth repeatedly.

Build and Format the Table

- **Create the table in Word.** Use Word's table feature and the current NPS template styles rather than tabs, spaces, screenshots, or pasted images. Editable tables reduce formatting and accessibility problems during review.
- **Label every column.** Give every column a brief, specific heading, including the leftmost or stub column. Include units in the heading when they apply to the entire column.
- **Use concise row labels.** Place labels close to the values they describe and use the same terminology as the narrative.
- **Align content for comparison.** Left-align descriptive text and use consistent alignment and decimal precision for numerical values. Align decimals when precision matters.

- **Use borders sparingly.** Follow APA 7 and NPS/TPO guidance. Use enough horizontal rules to clarify the structure, and avoid unnecessary vertical lines, heavy boxes, shading, or decorative effects.
- **Keep comparable tables consistent.** Use the same fonts, heading structure, labels, units, number formats, decimal places, symbols, notes, and category order for tables presenting related information.
- **Make the table understandable on its own.** Provide a clear number and title, complete headings, defined abbreviations, units, and notes needed to interpret the entries.
- **Handle missing or unavailable data consistently.** Use a defined symbol or abbreviation, such as an em dash, and explain its meaning in a note. Do not leave unexplained blank cells.

Use Parallel Wording

Items within the same column should use the same grammatical form. Parallel wording helps readers understand that the entries belong to the same category.

Nonparallel	Parallel
Project design	Project design
Identifying the requirement	Requirement identification
Completes evaluation	Evaluation

Use the Table in the Analysis

- **Introduce it before placement.** Refer to the table by number and identify the comparison or result readers should examine.
- **Interpret the result.** Explain the key pattern, exception, or implication; do not repeat every value in the table.
- **Avoid duplication.** Do not present the same information in a table, figure, and detailed narrative unless each format serves a distinct purpose.

Final Table Check

- The table is necessary and communicates one clear purpose.
- The table number and title follow APA 7 and NPS/TPO formatting.
- All headings, labels, units, abbreviations, symbols, and missing-data conventions are defined.
- Comparable entries are adjacent, parallel, and formatted consistently.
- Values, totals, percentages, calculations, and rounding have been verified against the source data.
- The table remains readable at final page size and does not split awkwardly across pages.
- The text introduces and interprets the table before it appears.
- Any source, adaptation, copyright, data limitation, or methodological detail is documented in the note and reference list.

Table 1 illustrates an effective table structure. Notice the descriptive title, grouped column headings, consistent units and decimal places, adjacent values for comparison, and a note that explains missing data and the illustrative source.

Table 1. Government Spending by Sector, 1977 and 2010
(In millions of U.S. dollars)

	Defense		Education		Health	
Nation	**1977**	**2010**	**1977**	**2010**	**1977**	**2010**
Nation A	16.4	22.2	9.7	13.6	6.2	4.8
Nation B	5.6	38.8	15.6	15.8	7.4	11.1
Nation C	48.1	32.1	—	8.1	15.8	24.5
Nation D	—	19.9	38.2	50.1	36.4	52.8
Nation E	27.4	15.4	17.3	4.8	82.1	134.9

Note. An em dash indicates that data were not available. Data are adapted from the fictitious International Budget Organization (2011, p. 214) for instructional purposes; the organization and source are not real.

7.6 Creating Useful Figures

A figure is any visual display that is not a table. Use a figure when it communicates a pattern, relationship, process, sequence, comparison, or location more clearly than text or a table. Every figure should support the analysis, be mentioned in the text before it appears, and remain understandable when viewed on its own.

Choose the Right Type of Figure

- **Line graph.** Shows change or trends across a continuous scale, such as cost or schedule performance over time.
- **Bar graph.** Compares values across discrete categories, such as program offices, contract types, or alternatives.
- **Scatterplot.** Shows the relationship between two quantitative variables and may include a trend line when analytically appropriate.
- **Flowchart or process diagram.** Shows a sequence, decision path, workflow, logic model, or organizational relationship.
- **Map.** Shows geographic, operational, or spatial information.
- **Photograph, drawing, or technical illustration.** Shows physical features, equipment, interfaces, configurations, or other details that are difficult to describe precisely in text.
- **Infographic or conceptual figure.** Summarizes several related ideas visually. Use this format sparingly and only when the design supports, rather than replaces, the analysis.

Build the Figure Around One Message

- **Define the purpose.** Write one sentence stating what readers should learn from the figure. If the message is unclear, revise the analysis before designing the visual.
- **Select only the necessary information.** Remove decorative icons, backgrounds, three-dimensional effects, redundant labels, and unrelated data that compete with the main finding.

- **Choose an honest scale.** Use axis ranges and intervals that represent differences accurately. Clearly identify breaks, logarithmic scales, normalized values, indexes, or other transformations.
- **Show uncertainty when relevant.** Identify error bars, confidence intervals, ranges, or other indicators and explain what they represent.
- **Protect sensitive information.** Confirm that labels, images, maps, screenshots, and metadata do not disclose controlled, proprietary, personal, operationally sensitive, or classified information.

Label Every Element Clearly

- **Use a descriptive title.** State what the figure shows without restating the conclusion or adding unnecessary detail.
- **Label axes and units.** Name each variable and include units of measurement, time periods, denominators, or scale definitions needed to interpret the values.
- **Use a legend only when needed.** Place the legend within the figure and define every line, symbol, pattern, or color that is not labeled directly.
- **Define abbreviations.** Define unfamiliar abbreviations in the figure or in a note beneath it so the visual can be understood independently.
- **Use consistent capitalization.** Apply sentence case or another deliberate convention consistently to comparable labels. For example: “Materiel solution analysis,” “Technology development,” and “Pre-systems acquisition.”
- **Add a note when necessary.** Use an APA general note beneath the figure to explain abbreviations, data exclusions, methods, uncertainty, modifications, or source and copyright information.

Design for Readability and Accessibility

- **Use legible text.** Use a simple sans serif font within the image and keep all labels readable at the final page size. APA 7 generally permits 8- to 14-point text inside figures.
- **Export a sharp image.** Use vector output or a sufficiently high-resolution image so lines, symbols, and text remain crisp after insertion into Word and conversion to PDF.

- **Do not rely on color alone.** Combine color with direct labels, symbols, line styles, shapes, or patterns so the figure remains understandable in grayscale and for readers with color-vision limitations.
- **Use adequate contrast.** Ensure text and data marks are distinct from the background and from one another.
- **Keep comparable figures consistent.** Use the same fonts, colors, symbols, scales, naming conventions, and category order when figures present related information.
- **Review the finished PDF.** Confirm that no labels are clipped, compressed, blurry, or too small and that the figure remains readable on screen and when printed.

Use the Figure in the Analysis

- **Introduce the figure before it appears.** Refer to it by number and identify the pattern, comparison, or relationship readers should examine.
- **Interpret rather than repeat.** Explain the significance of the visual and how it supports the research question, finding, conclusion, or recommendation.
- **Avoid duplication.** Do not present the same information in a figure, table, and detailed narrative unless each format serves a distinct purpose.
- **Use figures selectively.** Retain figures that advance the analysis; move useful supporting detail to an appendix and remove visuals that are primarily decorative.

Final Figure Check

- The figure is necessary and has one clear message.
- The figure number and title follow APA 7 and NPS/TPO formatting.
- Axes, units, categories, symbols, legends, and abbreviations are complete and accurate.
- Scales and visual proportions represent the data honestly.
- Text, lines, and images are readable at final size and accessible without relying on color alone.
- Capitalization, terminology, and styling match comparable figures.
- The text introduces and interprets the figure before it appears.

- Any source, adaptation, copyright, data limitation, or methodological detail is documented in the note and reference list.

Figures 1–3 illustrate several figure types. Review each example for analytical purpose, readability, labels, notes, and consistency with the guidance above.

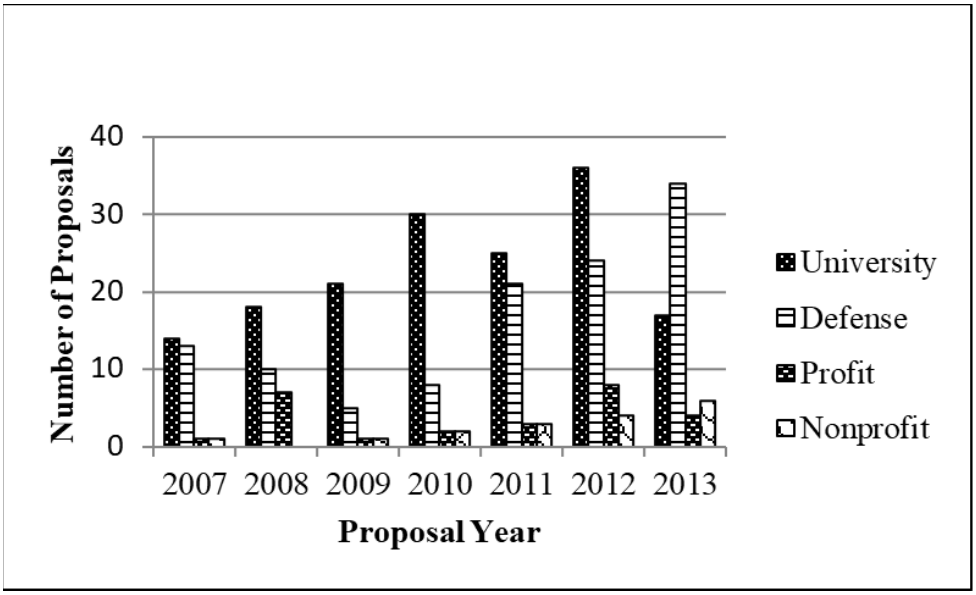

Figure 1. Annual Distribution of Research Proposals by Institution Type, 2007–2013
(Shaffer & Snider, 2014)

Note. Defense universities include NPS, Air Force Institute of Technology, Air Force Academy, DAU, Defense Academy of Cranfield University, and Bundeswehr University Munich.

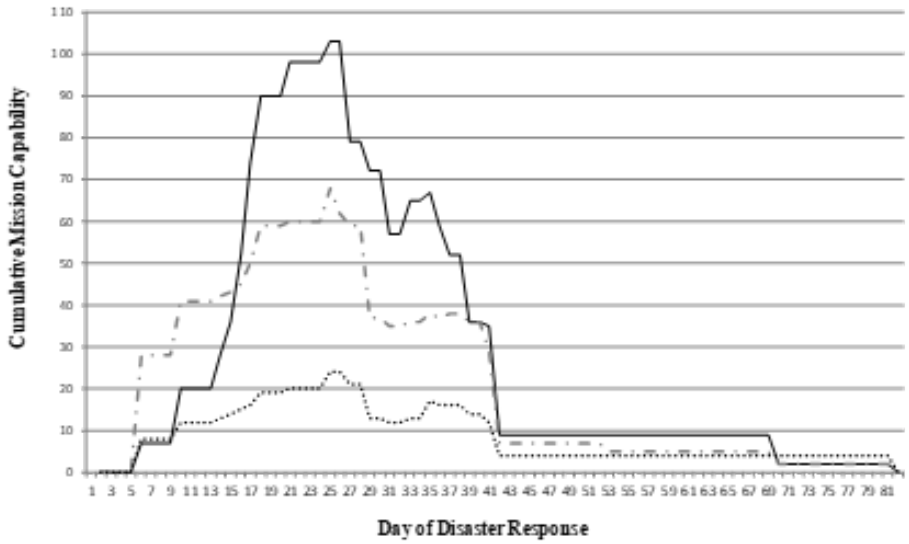

Figure 2. Cumulative Mission Capability for the Indian Ocean Tsunami
(Yoho, Greenfield, & Ingram, 2013)

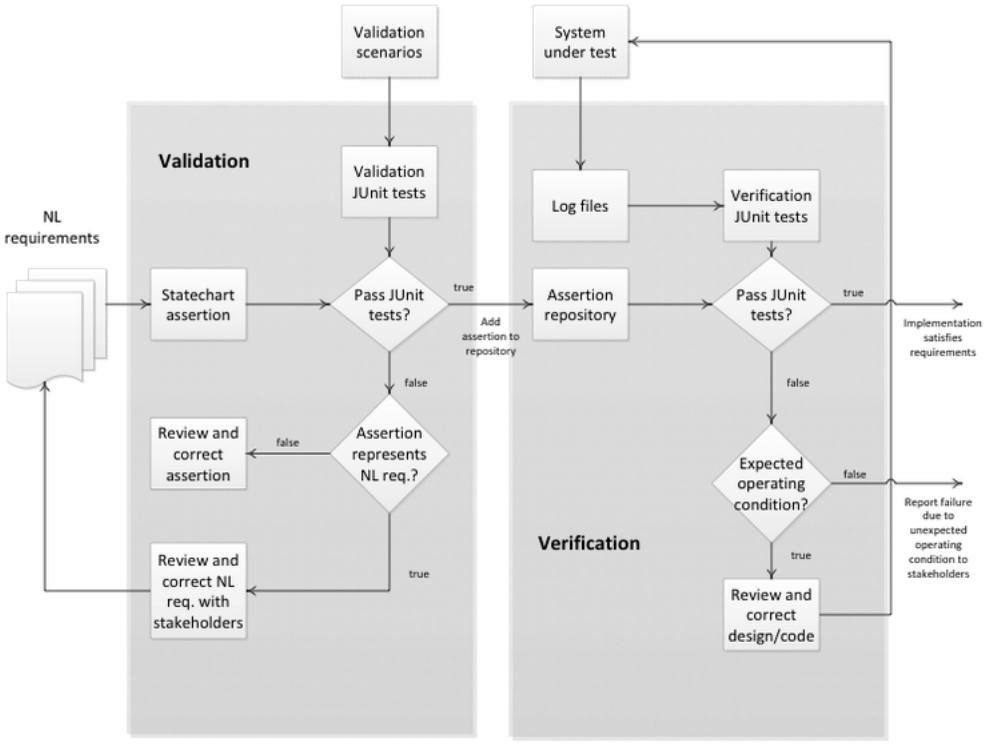

Figure 3. An End-to-End Validation & Verification Process

Note. We created this chart by modifying the original from Bonine, Shing, and Otani (2013)

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Chapter 8: APA 7 Citation and References

APA 7 uses an author–date system. Each source cited in the report must appear in the reference list, and each reference-list entry must support material cited in the report. Build citations while collecting sources rather than trying to reconstruct publication details at the end. The most reliable method is to capture four elements for every source: **author, date, title, and source**.

IMPORTANT! See below for guidance and tools to avoid plagiarizing.

Plagiarism Prevention 101

Citations / Avoiding Plagiarism - Graduate Writing Center - Naval Postgraduate School

Paraphrasing and Quoting: Bulleted and Numbered Lists

Using Signal Phrases Effectively

Paraphrasing and Quoting Responsibly

NPS Citation Guidance for Generative AI Use in Academic Work—All Citation Styles

8.1 Capture Source Information When You Find It

Save the source file or stable link and record the information below before moving to the next source. Use a citation manager, literature matrix, or research log, but verify imported records against the original document because database and AI-generated metadata may be incomplete or incorrect.

- **Author.** Record every individual author in the published order. If no people are named, record the responsible agency, command, office, organization, or working group exactly as shown.
- **Date.** Record the year and, when provided, the month and day. If no date appears, note “n.d.” Do not substitute the date downloaded for the publication date.
- **Title.** Copy the full title and subtitle. Also record the document type, edition, version, revision, series, report number, directive number, instruction number, field manual number, or other identifying number.
- **Source.** Record the journal, publisher, issuing agency, repository, or website; volume, issue, and page range for periodicals; Digital Object Identifier (DOI) when available; and a stable public URL when required.

- **Locator.** Record the page, section, paragraph, table, figure, appendix, timestamp, or heading used for important quotations, facts, and paraphrases while reading.
- **Access and version.** Save the final published version when possible and note whether the document is superseded, canceled, revised, draft, archived, controlled, or publicly releasable.

8.2 Create the In-Text Citation

Use a parenthetical citation when the author is not part of the sentence and a narrative citation when the author is named in the sentence.

- **Parenthetical:** (Author, Year)
- **Narrative:** Author (Year)
- **Two authors:** (Author & Author, Year); in narrative text, use "and."
- **Three or more authors:** (First Author et al., Year) from the first citation.
- **Group author:** (Organization Name, Year). If an abbreviation will be used repeatedly, introduce it in the first citation: (Government Accountability Office [GAO], Year); later: (GAO, Year).
- **No date:** (Author, n.d.).
- **Direct quotation:** (Author, Year, p. 12) or (Author, Year, pp. 12–13). For an unpaginated source, use a paragraph, section, heading, or timestamp locator.

Cite paraphrased ideas as well as quotations. Page numbers are optional for paraphrases but helpful when the source is long or difficult to navigate. Place the citation where readers can tell which claim it supports; do not place one citation at the end of a long paragraph containing information from several sources.

8.3 Build the Reference List

Use the four-part APA sequence as the basic syntax:

Author. (Date). *Title*. Source.

- Alphabetize entries by the first author or group author.
- Use a hanging indent of 0.5 inch and double-space as required by the current NPS template.

- Use sentence case for titles of reports, books, articles, and webpages: capitalize the first word, the first word after a colon, and proper nouns.
- Use title case and italics for journal titles. Italicize the journal volume, but place the issue number in parentheses without italics.
- Present DOIs as https://doi.org/... and do not add a period after a DOI or URL.
- Use a retrieval date only for content designed to change over time, such as a continuously updated dashboard or wiki.

8.4 Government and Military Reports

Treat the agency, department, service, command, office, commission, or other responsible organization as the group author unless named individuals are credited as authors. Use the most specific responsible organization shown on the title page, but retain the hierarchy needed for readers to identify it. Include a report, directive, instruction, manual, or publication number in parentheses after the title when one is provided.

> **Syntax—government or military report:**
> Agency or Organization. (Year). *Title of report* (Report No. xxx). Publisher or Parent Organization. URL
>
> **Syntax—directive, instruction, or manual:**
> Issuing Organization. (Year, Month Day). *Title of document* (Document No. xxx). URL

- If the author and publisher are the same organization, omit the publisher to avoid repetition.
- Use the date of the version consulted and record any change, revision, or supersession information needed to distinguish it.
- If the source is available only on a restricted system, do not invent a public URL. Provide the reference elements readers can verify and follow current NPS guidance for restricted sources.
- A government report downloaded from a website is still cited as a report—not as a generic webpage.

8.5 Journal Articles and Articles Downloaded from the Web

Identify the publication type before formatting the reference. The fact that a PDF was downloaded from the web does not make it a webpage. Use the journal-article format for a journal article, the report format for a report, and the book format for an ebook.

Syntax—journal article:
Author, A. A., & Author, B. B. (Year). Title of article. *Title of Journal, volume*(issue), page–page. DOI or URL

Syntax—article with an article number:
Author, A. A. (Year). Title of article. *Title of Journal, volume*(issue), Article e12345. DOI

- Include the DOI whenever one is assigned, even when the article was accessed through a library database.
- If an article has no DOI and came from a common academic database, end the reference after the page range; do not include the database name or a session-specific library URL.
- If the article has no DOI but has a stable public URL that readers can access, include that URL.
- Do not cite a database search-result page, downloaded file path, or browser address that will not work for another reader.

8.6 Books, Edited Books, and Chapters

Syntax—whole book or ebook:
Author, A. A. (Year). *Title of book* (Edition). Publisher. DOI or URL

Syntax—chapter in an edited book:
Author, A. A. (Year). Title of chapter. In E. E. Editor & F. F. Editor (Eds.), *Title of book* (pp. xx–xx). Publisher. DOI or URL

Do not include the city or state of the publisher. Include an edition only when it is not the first edition. Cite the whole book only when the work as a whole was used; cite the chapter when the chapter has its own author in an edited volume.

8.7 Webpages and Online Content

Syntax—webpage:
Author or Organization. (Year, Month Day). *Title of webpage*. Site Name. URL

- Use webpage format only when the source does not fit a more specific category such as report, article, book, dataset, policy, or press release.
- When the author and site name are the same, omit the site name.
- Use the most specific publication or update date shown. If no date is available, use "n.d."
- For changing content, add a retrieval date before the URL: Retrieved Month Day, Year, from URL.

8.8 Using and Citing Generative AI

IMPORTANT! AI tools and APA guidance change quickly. Before finalizing your capstone research report, review the **NPS Guidelines for Generative AI**, Knox Library **Generative AI**, the **NPS Guidance on Disclosing Generative AI Use in Academic Work**, the **NPS APA citation guide**, and the **Generative AI for Research and Writing Slides** for current requirements on permitted use, citation, and disclosure.

Follow current NPS, program, advisor, and course requirements before using generative AI. AI may support permitted research or writing tasks, but it is not a reliable factual source. Verify factual claims and citations using authoritative sources, and cite those original sources. Never include a fabricated or unverified reference suggested by AI. Do not enter controlled, proprietary, personal, export-controlled, or other sensitive information into an unapproved tool.

Citation or Disclosure?

- **AI used only as a discovery aid.** Read and cite the original sources you verified; do not cite the AI output as evidence.
- **AI output quoted, reproduced, or analyzed.** Cite the AI tool and preserve enough information to identify or reproduce the output when permitted.

- **AI used to support the research or writing process.** Provide the disclosure required by current NPS guidance, describing the tool, purpose, extent of use, and how you verified and remained responsible for the work.
- **General APA syntax for an AI tool:**
  Company or Developer. (Year). *Name of tool* (Version) [Large language model]. URL

8.9 Final Citation Check

- Open every DOI and URL and confirm that it reaches the intended source.
- Verify every author, date, title, report number, volume, issue, page range, DOI, and URL against the original source.
- Match every in-text citation to one reference-list entry and every reference-list entry to at least one in-text citation.
- Check that quotations and close paraphrases have precise locators and that quotation marks or block formatting are correct.
- Confirm that group-author abbreviations are introduced once and used consistently.
- Confirm that titles use the correct capitalization and italics for the source type.
- Review AI-assisted citations manually and remove any source that cannot be verified.
- Compare the final reference list with the current **NPS APA citation guide** and resolve uncertain cases with DKL, the Graduate Writing Center, an advisor, or the thesis processor.

8.10 APA 7 Reference Cheat Sheet

Use the examples below as patterns. Replace every sample element with information from the source you actually used, preserve the published order of authors, and verify the finished reference against the original document. Examples are illustrative unless a live link is provided.

Source type	Reference-list example	In-text citation
Government report	Government Accountability Office. (2025). *Defense acquisitions: Actions needed to improve program cost estimates* (GAO-25-000000). https://www.gao.gov/	First: (Government Accountability Office [GAO], 2025) Later: (GAO, 2025)
Military report	Department of the Navy. (2025). *Annual acquisition program assessment* (Report No. DON-25-01). https://www.navy.mil/	(Department of the Navy, 2025)
Directive, instruction, or manual	Department of Defense. (2025, January 10). *Defense acquisition policy* (DoD Instruction 5000.00). https://www.esd.whs.mil/DD/	(Department of Defense, 2025)
Journal article with DOI	Rivera, M. L., & Chen, T. A. (2024). Schedule risk and supplier integration in defense acquisition programs. *Journal of Defense Analytics, 18*(2), 101–124. https://doi.org/10.0000/jda.2024.0001	(Rivera & Chen, 2024)
Journal article from a database, no DOI	Patel, R. K. (2023). Contract incentives and technical performance. *Acquisition Research Quarterly, 12*(3), 44–63.	(Patel, 2023)
Journal article with article number	Lewis, J. P., Kim, S. Y., & Ortiz, D. M. (2025). Predicting cost growth with early program indicators. *Defense Management Review, 9*(1), Article e1047. https://doi.org/10.0000/dmr.2025.1047	(Lewis et al., 2025)
Whole book	Morgan, A. J. (2022). *Managing complex defense programs* (3rd ed.). Harbor Press.	(Morgan, 2022)
Chapter in an edited book	Nguyen, P. T. (2023). Building resilient acquisition strategies. In L. M. Foster & R. D. Cole (Eds.), *Contemporary defense management* (pp. 77–98). Meridian Academic.	(Nguyen, 2023)

Source type	Reference-list example	In-text citation
Webpage	Naval Postgraduate School. (2026, May 12). *Acquisition research resources for students*. https://www.nps.edu/	(Naval Postgraduate School, 2026)
Changing webpage or dashboard	Department of Defense. (n.d.). *Defense acquisition performance dashboard*. Retrieved September 11, 2026, from https://www.defense.gov/	(Department of Defense, n.d.)
Generative AI tool	Company or Developer. (2026). *Name of tool* (Version) [Large language model]. https://example.com/	(Company or Developer, 2026)

Fast Source-Type Check

- **Downloaded a PDF from a government website?** If it has a report title and report number, use the report format.
- **Downloaded an article from a library database?** Use the journal-article format; do not cite the database search page.
- **Read an ebook?** Use the book format and add a DOI or stable public URL when required.
- **Used one chapter written by a different author?** Use the chapter-in-an-edited-book format.
- **Used a page that changes continuously?** Include a retrieval date.
- **Used AI to locate a source?** Verify and cite the original source, not the AI suggestion.

Final Research Quality Check

- **Read the draft aloud.** Hearing the text can reveal awkward wording, missing transitions, and sentences that are too long or difficult to follow.
- **Keep the research questions visible.** Confirm that each major section supports the central topic and helps answer a primary or secondary research question. Remove interesting material that does not advance the analysis.
- **Review the organization.** Check that sections appear in a logical order, paragraphs develop one main idea, and transitions explain how ideas and sections connect.

- **Use terms consistently.** Use the same term for the same concept throughout the report unless a distinction is intentional and explained.
- **Define abbreviations and specialized terms.** Spell out and define an unfamiliar term at first use, followed by the abbreviation in parentheses. Use the abbreviation consistently afterward.
- **Maintain parallel structure.** Write items in lists, headings, and series using the same grammatical pattern.
- **Check verb tense.** Use tense consistently and change it only when the time relationship changes—for example, past tense for completed procedures and results and present tense for established knowledge or conclusions that remain applicable.
- **Choose an appropriate point of view.** Avoid addressing readers as "you" in the capstone report unless the advisor or program permits it. Use first person when it improves clarity and is acceptable under advisor and program guidance.
- **Use active voice when it improves clarity.** Prefer direct sentences that identify the actor, but retain passive voice when the action or result is more important than the actor or when the actor is unknown.
- **Verify tables and figures.** Confirm that every visual is mentioned in the text, numbered correctly, titled consistently, readable at final size, and formatted according to APA 7 and current NPS/TPO guidance.
- **Verify citations and references.** Make sure every in-text citation has a matching reference-list entry and every reference-list entry is cited in the report. Check authors, dates, titles, publication details, locators, Digital Object Identifiers (DOIs), and URLs against the original sources.
- **Integrate sources into the analysis.** Introduce a source by the author's surname or organization name when useful, provide the APA 7 citation, and explain how the evidence supports, qualifies, or challenges the point. Introduce quotations, cite them with a precise locator, and interpret their significance rather than allowing them to stand alone.
- **Complete a final accuracy check.** Review names, acronyms, dates, calculations, cross-references, headings, table and figure numbers, and claims against the underlying evidence. Verify any citation or factual detail suggested by AI in the original source before retaining it.

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