WRITING ARGUMENTS IN STEM

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ABOUT THIS COLLECTION

OVERVIEW

Writing Arguments in STEM is a collection of Open Educational Resources (OER) focused on argumentation, rhetoric, and communication in the STEM fields. This project consists of 25 chapters that have been selected from other OER resources on subjects like technical communication, reasoning and argumentation, and writing. A team of faculty at California Polytechnic State University, San Luis Obispo, curated the contents to support instructors teaching first-year courses in critical thinking and communication.

Writing Arguments in STEM was created using Pressbooks, an open-source web-based publishing tool for hosting and disseminating OER-published materials. This collection is zero cost and is meant to be used and distributed widely by students, instructors, and individuals interested in the subject.

HOW TO READ THIS COLLECTION

This collection is divided into the following eight parts, each with its own group of chapters:

1. Introduction to Stasis Theory
2. Reasoning
3. Elements of Argument
4. Information Literacy
5. Research Writing in Academic Disciplines
6. Data Visualization
7. Writing in STEM for Audiences
8. Genre Conventions

Because each chapter has a different author, the collection can be read out of order.

The chapters were selected to support students in meeting the learning outcomes for Area A3 Critical Thinking and Communication in the CSU's General Education program by teaching critical thinking, logical reasoning, information literacy, and written communication through the art of argumentation.

ATTRIBUTIONS

ABOUT THE PUBLISHER

ABOUT OER

OER are free teaching and learning materials that are licensed to allow for revision and reuse. They can be fully self-contained textbooks, videos, quizzes, learning modules, and more. OER are distinct from public resources in that they permit others to use, copy, distribute, modify, or reuse the content. The legal permission to modify and customize OER to meet the specific learning objectives of a particular course make them a useful pedagogical tool.

ABOUT PRESSBOOKS

Pressbooks is an open-source, web-based authoring tool based on WordPress, and it is the primary tool that we used to create and adapt course materials. Pressbooks should not be used with Internet Explorer. The following browsers are best to use with Pressbooks:

- Firefox
- Chrome
- Safari
- Edge

Attributions

ACCESSIBILITY STATEMENT

We believe education needs to be available to everyone, which means supporting the creation of free, open, and accessible educational resources. We are actively committed to increasing the accessibility and usability of the OER we produce.

ACCESSIBILITY FEATURES

We used Pressbooks to create and distribute this project. In May 2018, Pressbooks announced their accessibility policy, which outlines efforts and demonstrates commitment to making the software accessible. The web version of this resource has been designed with accessibility in mind by incorporating the following features.

- It has been optimized for people who use screen-reader technology.
    - all content can be navigated using a keyboard.
    - links, headings, and tables are formatted to work with screen readers and images have alt tags.
- Information is not conveyed by color alone.
- Font may be resized.

OTHER FILE FORMATS

In addition to the web version, this book is available in a number of file formats, including PDF, EPUB (for eReaders), MOBI (for Kindles), and various editable files. These formats can be retrieved from the "Download this book" drop-down menu on the book's home page.

ABOUT THE CURATORS

This collection is compiled by a team of faculty in the English department at California Polytechnic State University, San Luis Obispo:

- **Jason Peters (project lead)** is associate professor of English and director of the department's composition program. He teaches composition theory, translingual writing and literacy, and environmental rhetoric.
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ACKNOWLEDGEMENTS

Creation of this project was funded by the California State University (CSU) Affordable Learning Solutions program that enables faculty to choose and provide more affordable, quality educational content for their students through strategies and initiatives that aim to ease the adoption process. Currently, nearly every CSU campus has an Affordable Learning Solutions coordinator to help drive the initiative for adoption of OER. Campus affiliates work to increase faculty knowledge of the benefits of OER through workshops, events, and faculty showcases.

Curator Note

This English course textbook, *Writing Arguments in STEM*, would not be possible without the source material found in different OER repositories. All of the material was compiled allowing for the material to be organized and reviewed for best practices by the curators. We are grateful to the many OER contributing authors who through their involvement in the OER movement allowed us to curate and redistribute their work in this new textbook.

About the Cover

Shaidy Ruiz, CSU Chancellor's Office Communications Analyst, designed the cover for this OER. The image used was taken by Joe Johnston, the Cal Poly University Photographer, used with his permission and a BY-NC-ND license.

PART I

INTRODUCTION TO STASIS THEORY

1.

HOW STASIS THEORY HELPS YOU WRITE A BETTER PAPER

By Stacie Draper Weatbrook

Stasis theory can do three things for you in organizing your writing:

1. It can help you organize the flow of your paper by giving background information and context in a way the audience will better understand.
2. It can re-define what the argument should be about.
3. It can help you narrow your topic so you (and your audience) don't get overwhelmed by all the information out there.

You've been given a writing assignment. You research. You read. You prepare to write. But how do you get the gazillion pieces of information organized in a way that makes sense to you and, ultimately, your audience? The answer involves understanding and being able to classify the types of arguments being made.

Let's stop here and define "**argument."** In rhetoric, an argument is "*a claim with reasons,"* not a fight or disagreement, as we tend to use the word in everyday language.

A lot of information goes into the topics and discussions you will research. A lot of claims are being made all at once. If you were researching bees, for example, you might find the following claims in multiple sources as you did research:

- Pesticides should be banned
- Everyone should plant flowers to attract bees
- Mold and viruses threaten bees
- The bee population is declining due to colony collapse disorder
- Almonds and apples are almost entirely pollinated by bees
- "Murder Hornets" attack honey bees

- Local honey helps seasonal allergies
- Honey bees are displacing native bees
- Bees are a keystone species
- Planting native wildflowers helps native bees
- Decreased bee populations hurt the economy
- People can't survive without bees
- Monoculture is bad for the environment
- Pesticides and toxins threaten bees
- Bees are essential to one-third of the food consumed in the United States

Shopping the Clearance Rack: Identifying and Classifying Claims

Notice these claims are all over the place? Sorting through the information is just as difficult as shopping the clearance rack at Kohls or Macy's: it's not an activity for the faint of heart. You're looking for a great bargain—and it's there to be found—but the women's shirts are mixed in with teen graphic tees, career jackets, and pajamas. The different sizes are supposed to be organized on racks by size but are usually more random than not.

When you write, it's your job to organize and control the flow of information. Your audience will not have the patience to sort through a confusing collection of ideas. That's your job as a writer. So, just like shopping a clearance rack and sorting through the sizes, colors, and types of clothes for that great deal, you will need to sort through the types of claims you find and settle on a clear claim (does the term "**thesis statement"** sound familiar?) and supporting reasons. Types of claims can be classified into five different levels or **stases.** Below, the five levels of argument are listed with examples of possible research questions for each of the stases:

FACT — This level establishes what happens (happened) and verifies details in question.

"Is the overall bee population declining?"

DEFINITION — This level seeks to classify and name an occurrence.

"Are honey bees actually an invasive species?"

CAUSE & EFFECT — This level shows the precursors and/or results of an issue.

"Can local honey prevent allergies?"

VALUE — This level argues how important, common, serious, or widespread an issue is.

"How extensive is colony collapse disorder?"
"How dangerous are murder hornets to bees?"

POLICY — This level proposes an action or solution to an issue.

"How can gardeners be encouraged to plant native flowers to attract native bees?"

The ability to classify claims being made in an argument gives clarity to the situation and can lead to discussion and understanding of the issue.

Ancient Greeks and Romans used the stases to thoroughly discuss matters, especially legal matters. They wouldn't move onto the next level if a previous level wasn't resolved. How do these stases play out in everyday life and writing?

Only after a doctor is fairly certain of the symptoms (FACT/DEFINITION), causes (CAUSE & EFFECT), and severity (VALUE) of those symptoms will they suggest a course of treatment or write a prescription (POLICY).

Classical rhetoricians used stases as a way to logically classify and understand the accusations and counter-arguments in legal cases. A judge will not sentence a defendant accused of homicide until the evidence of the case has been established (FACTS). Once the homicide has been classified as felony murder rather than a first degree murder (DEFINITION), the judge can apply the law (CAUSE & EFFECT/VALUE) and hand down a sentence (POLICY).

You would like to go to a new restaurant for lunch but your friends have heard it's expensive and they don't want to spend a lot of money. To convince your friends to go, you present them with information they were not aware of—that the lunch menu is actually a good deal, especially if you order the daily special (FACT/DEFINITION). You tell them the atmosphere is fun and modern and it's worth at least trying (CAUSE & EFFECT/VALUE). Then, you propose going to the restaurant (POLICY).

A student writing a paper proposing bee-friendly gardening tips (a **policy**-level argument) might first use the stases to help the audience understand the big picture of the issue:

> Most people don't realize it, but bees are vital to food production because they pollinate plants. In the last ten years, beekeepers have reported losing over 30% of their bees. Native bumble bee species are also declining. Most people also are shocked to learn that most bees do not live in hives; nearly 70% of native bee species are ground dwelling. While pesticides are commonly blamed for decreased bee populations, colored mulches and barks also pose a significant risk to bees because the synthetic dyes contain toxins.

This paragraph flows from the facts (bee populations are decreasing and are vital to food supply) to definition (most bees are ground dwellers) to cause and value (pesticides and colored mulches are a significant risk). The audience could then reasonably accept a thesis proposing suggestions or policy for keeping their gardens bee-friendly:

> For this reason, it's essential to use bee-friendly products in your garden.

The rest of the document could focus on the policy of adopting bee-safe gardening practices.

Using stasis theory in the introduction can help move the audience through an orderly set of information in order to introduce the thesis. It can also serve as an outline to discuss each level of the issue.

Static Cling And Waterproof Bath Towels: Start Where the Audience Is

The idea of stasis theory is audience-centered, meaning that in traditional argument or exploration, the writer (also called the rhetor) shouldn't move past the point where the audience is.

The word "*stasis"* shares the same root as the word "*static"* (as in "*static electricity"* and "*static cling"*). So, when you don't start where your audience is, it's just as bad as getting halfway through a job interview and discovering a random sock clinging to the outside of your dress slacks.

Disagreement often happens when parties aren't talking at the same level or stasis. When this disagreement happens, it can be a time for contentious name calling or it can be a time for open-minded discussion and discovery. Stasis theory gives a system for identifying when parties are giving claims at cross purposes:

> Your spouse or housemate: "Let's get grey countertops."
>
> You: "Do our countertops need to be replaced? Are they really that old?"

Here, one party is discussing policy: which color should we choose for the new countertops? Meanwhile, the other isn't sure of the **facts/definition:** do we even need new countertops?

Stasis theory helps identify the point where discussion needs to occur: do our countertops really need to be replaced? Rhetorician Keith Grant-Davie explains, "The word 'stasis' (plural 'stases') literally means a 'slowing down' or a stopping point. In rhetoric, a stasis is an issue that may be contested or a question that needs to be resolved before the argument can proceed." As in our example of the bees or the countertops, an audience will be much more receptive to changes they can make if they understand why it's important.

Even if you present information in a logical order according to the stases, your audience will not always buy into the flow of information you present. Not all information moves smoothly through the stases from fact to **policy**. Sometimes audiences get "stuck" on a stasis (think static cling again) and will take issue or outright reject a stasis level you take for granted. Notice how this mock Kickstarter campaign derails in its attempt to logically go through the stases levels to encourage the audience to adopt the policy to buy a Fabulous Waterproof Towel:

> As you know, there are over 327 million people in the United States, many of whom bathe or shower regularly. Our market research has shown that wet bath towels can be a problem because they are thick and difficult to dry, allowing mold to colonize, especially in more humid parts of the country. Because of this problem, our department has developed the Fabulous Waterproof Towel as a solution. Please contribute to this project today!

The remainder of the Kickstarter campaign would–we can only assume since it's contrived—focus on why people should adopt the policy to buy into the Waterproof Towel technology.

But alas, this is one idea that's probably not going to get much traction. Here's an analysis of how an audience would likely react to the stases of this dubious Waterproof Towel proposal:

> As you know, there are over 327 million people in the United States, many of whom bathe or shower regularly.

Here, the audience isn't likely to disagree. They can quickly look up the population of the United States and because of the qualifier "many" will not disagree that a large number bathe or shower. There seems to be no fact or definition issue here.

> Our market research has shown that wet bath towels can be a problem because they are thick and difficult to dry …

The audience might still be on board. Bath towels *are* thick and do take a long time to dry. That a bath towel will get wet is an effect the audience will likely accept. No issue here, move along.

> … allowing mold to colonize, especially in more humid parts of the country.

The audience might take issue at this point, the value stasis. Here is the stopping point: the audience probably doubts the claim that wet bath towels are the huge problem they are made out to be. After all, how many cases of death by bath towel mold have been reported? Yes, bath towels get wet, but they usually dry within a few hours to a day, even in humid climates. Of course, the audience probably knows a simple thing to do is to put the bath towel in the wash after use or simply hang it to dry. Not a big deal. The audience will likely not find the problem of wet bath towels a pressing issue. Here, at the value stasis is the "stopping point," where the issue needs to be resolved. But how can it be resolved? It's a waterproof towel, an undeniably useless invention.

> Because of this problem, our department has developed the Fabulous Waterproof Towel as a solution. Please contribute to this Kickstarter campaign today!

Because the audience wasn't convinced at the value stasis that wet bath towels are a widespread and difficult issue, the policy argument, "contribute to this Kickstarter campaign" isn't likely to be successful. At least we should hope not.

Obviously, the waterproof bath towel example is fabricated, but think of situations in your own life and in the public sphere where people disagree. When this discord happens, it can be a time for shouting, contention, oversimplification, and caricatures or it can be a time for thoughtful listening, open-minded discussion, and respect for differing viewpoints.

What Can Stasis Theory Do For You?

Stasis Theory Helps Organize the Flow of Information.

You can organize your paper along the natural order of the stases to help your audience follow the information you present. Using stasis theory helps you organize information to help the audience understand the state of the issue.

When you understand the natural levels of argument—**fact, definition, cause & effect, value, and policy**—it makes it easier to think about your purpose (what you want to have happen as a result of your document) and how your audience will interact with the information presented.

Stasis Theory Helps Writers Find the Interesting Angles.

Understanding how claims are classified helps writers identify how individual claims fit into the overall debate. It's this ability to sort through information for the audiences that helps us deliver a clear message.

But stasis theory can do more than just help us organize; it can help us identify interesting and surprising angles in a debate. Careful research can help you move beyond the obvious arguments to find new facets in the debate.

Trust me. Your instructor will appreciate a new take on your subject.

Stasis theory not only helps you organize your thoughts, it also helps you redefine the issue and show other ways to look at a problem. To find new ways to look at issues and look for clarification or re-interpretation of facts, new definitions, little-known causes, surprising effects, events and statistics showing overwhelming importance, and the innovative solutions of an issue.

Being able to carefully analyze an issue and classify the associated claims will help you find new ways to look at old subjects.

Stasis Theory Helps Narrow Your Topic.

When we encounter mountains of information about our topic, we often feel compelled to dump everything we know into one paper (true story: my first draft of this paper was over 7000 words). Understanding stasis theory helps pare down the issue to a manageable level and concentrate the bulk of the paper on the necessary stasis. That means you don't have to cover every stasis or even most of them in detail. Hopefully, that helps you breathe easier. That's not to say that after focusing your paper about the definition or causes of your issue, your instructor won't ask you to add some background in the introduction or a conclusion briefly suggesting a solution, but it should be an immense relief to know it's okay to focus on just a small part of the issue.

Conclusion

Ideally, issues of policy should be decided in public discourse only when all parties can agree on the earlier stases. After all, the intent of this ancient rhetorical strategy was to help audiences arrive at consensus at each level. As you know, however, in the case in our society, polite, respectful discourse aimed at consensus is nowhere near a reality. All sides seem too quick to try to pass laws and enact policy without coming to a proper understanding on the complexities of issues. Rhetoricians Jeanne Fahnestock and Marie Secor explain the value of understanding the stasis of arguments and assert that policy arguments are often premature (5). Still, they insist that stasis theory is an essential tool for discussion and understanding, saying, "We argue about many issues that cannot be resolved well enough for action to follow, but that can be clarified to the extent that we come to know what we do not know" (5). Coming to "know what we do not know" is a powerful literacy skill to help us examine issues and understand their complexity and relevance in personal and public discourse.

Works Cited

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Attributions

2.

USING STASIS THEORY TO NARROW YOUR TOPIC

by Stacie Draper Weatbrook

How We Situate Writing to Create Meaning

Many Salt Lake Community College English 1010 students are asked to write a paper that looks at multiple views in a debate in order to better understand the issue. Students are instructed to start with a research question with a potential for at least three answers/viewpoints. The aim of the paper is to venture beyond identifying simple pro/con viewpoints to exploring issues in their complexity. Understanding how to classify arguments made in a debate not only helps students narrow their topic but also allows for easier organization in researching and drafting.

Remember back when you were six and you were asked to clean up your toys? But that wasn't the worst part. You weren't allowed to simply stash the random Polly Pockets, Hot Wheels, Bionicles, Barbies, and Legos on just any shelf. You were tasked with the Herculean act of putting the toys *where they belonged*. It was enough to make you want to lie on the floor in despair, with Legos digging into your back to add to the dramatic effect.

Hopefully, some compassionate adult was there to show you the shelf for the dolls and Bionicles, the box for the Legos, and the bag to keep the Polly Pocket clothes out of the way of the vacuum. Today, as a college student, you can organize your dishes, spices, and socks as expertly as Martha Stewart. And you would too, if you weren't working two jobs and going to school.

When you are given a research assignment, it can be just as overwhelming as cleaning your room was when you were six. You might feel the same loss of hope when you look at your digital mountains of database searches and Google results. Fortunately, research and research writing don't have to be daunting, especially if you know how to mentally sort the information you find. As luck would have it, the ancient Greeks and Romans gave us shelves and bins to sort out debates and make complex information more manageable.

5 Types of Claims: Ways You Can Narrow Your Topic

Classical rhetoric identifies arguments by levels or "*stases"* (plural for "*stasis"*). The idea of stasis theory, as it is called, comes from traditional argument and issue exploration and helps writers start where their audience is to move through a logical flow of information.

When you research your topic, picture these five stases, or types of arguments, as shelves or bins to sort the issues about your topic:

FACT — This level establishes what happens (happened) and verifies details in question.

DEFINITION — This stasis seeks to classify and name an occurrence.

CAUSE & EFFECT — This stasis shows the precursors and/or results of an issue.

VALUE — This level argues how important, common, serious, or widespread an issue is.

POLICY — This final level proposes an action or solution to an issue.

Choosing a stasis for your issue will help you narrow down your topic and keep your research question manageable. Many composition classes at Salt Lake Community College ask students to do a Viewpoint Synthesis or Issue Exploration essay that shows multiple views of an issue. Because the Viewpoint Synthesis or Issue Exploration is simply a summary of viewpoints and not an argumentative essay, you might choose any stasis as the focus of inquiry. It is not the assignment's burden to resolve each stasis, but rather to report how others and you see the issue.

Keeping your topic narrow will help to avoid frustration as you sift through the digital piles of information for the Viewpoint Synthesis paper or any other research you're assigned. In other words, you're only asked to sort through the Legos, and then, only the Star Wars Legos.

Consider the following questions at each stasis and how they can lead to focused questions with multiple answers.

Fact

Arguments of **fact** must be questions where the "facts" are not easily agreed. A question like "What color is the Markosian Library?" or "How many people voted in the mid-term elections?" could easily be answered based on a quick look at the library's exterior or research into the election data. These questions have answers that can be easily verifiable and are not considered viewpoints.

Many **fact** stasis questions deal with scientific or historical topics that lend themselves to varying interpretations and require verification, often showing a fundamental disagreement about what the reality is.

An example of a **fact** stasis question surrounds the human microbiome—the colonies of yeast, bacteria, and viral cells hosted in the human body. Consider the following **fact** stasis question and possible viewpoints:

Viewpoint 1) There are 10 microbial cells for every 1 human cell.

Viewpoint 2) There are actually 3 microbial cells for every 1 human cell.

Viewpoint 3) The ratio is actually 1.3 microbial cells for every 1 human cell.

When writing your Issue Exploration paper, you will include a summary of the issue where you state the different views. Later in the paper, you'll expand and explain each of the views. Notice how the various views in this **fact** stasis debate can be summarized:

> How many microbes are in the human body? For years, popular media and scientific journals reported that there are 10 times as many microbial cells in the human body as there are human cells. That number was the standard until 2014 when the American Academy of Microbiology stressed the number of both microbial and human cells were only estimates and the ratio of microbial-to-human cells were actually closer to 3:1 (Crew). In 2016, Ron Sender and a team of biologists used a population of standard 70-kg males to give a new estimate of 1.3 microbial cells to every 1 human cell.

The Viewpoint Synthesis/Issue Exploration paper would then go on to discuss the merits and limitations of each of the three viewpoints.

Definition

Definition arguments seek to classify an occurrence or condition. The **definition** stasis is used when there is some disagreement about what to call something (think Pluto being demoted from "*planet"* to "*dwarf planet"*). Definition arguments are also used in criminal court cases (X killed Y; was it View 1: self-defense; View 2: felony murder; or View 3: manslaughter?)

If you are researching bullying, you could use the **definition** stasis to seek to classify which behaviors should be considered bullying:

Viewpoint 1) Bullying is "a harmless rite of passage in childhood" and can be ignored.

Viewpoint 2) Bullying is any mean or rude behavior.

Viewpoint 3) Bullying is any behavior that employs an imbalance of power to control or harm others where the actions are repeated.

A summary of the issue and these viewpoints for the introduction to your Viewpoint Synthesis paper might look like this:

> There's been a lot of attention to bullying in the past years. Some people view bullying as simply a part of childhood. Psychiatrist William Copeland refers to a study by Arseneault, Bowes, and Shakoor who report childhood bullying is still "commonly viewed as just a harmless rite of passage or an inevitable part of growing up." On the other side of the spectrum, acute awareness to bullying has given way to defining any rude, mean, or even contrary behavior toward another person as bullying. Other organizations like StopBullying.gov and child therapists like Signe Whitson define bullying specifically as any behavior that employs an imbalance of power to control or harm others where the actions are repeated.

The Issue Exploration paper would then go into detail about each of these definitions.

Sometimes, a third viewpoint is difficult to find. The reason might be that it's sitting right in front of us as the accepted status quo and we don't stop to recognize it's such a common practice or belief that it isn't given a second thought. Think back to the issue of how many cells make up a human microbiome. It took nearly 40 years for scientists to start questioning where the original estimate came from. As in the question on how to define bullying, one of the viewpoints is what most people traditionally thought about the issue generations ago, and, sadly, how that idea carries forward today. Questioning the status quo or commonly accepted ideas helps identify prevalent viewpoints and allows for other viewpoints to be considered and proposed.

Cause and Effect

Asking **cause & effect** questions helps narrow down a topic to the reasons behind and results surrounding an issue. Sometimes, asking **cause & effect** questions can be tricky, because they often produce a laundry list of causes or reasons for an issue rather than answers that are diametrically opposed. If we ask a cause-and-effect question like "*what are the benefits of recycling?"* we get a list of reasons: *to conserve resources, to offset our carbon footprint, to feel good about ourselves, to have a zero-waste community, to save money.* These reasons are not actual viewpoints, especially since all three reasons aren't mutually exclusive; each of these reasons can exist happily with the other reasons, so the question isn't likely to identify a real issue or debate.

When asking a **cause & effect** question—or any question for our Viewpoint Synthesis assignment—there must be at least two answers that are mutually exclusive, meaning they can't exist together. Here's an example:

> Many people believe an effect of recycling is saving resources; however, John Tierney in his *New York Times* piece, "The Reign of Recycling," says recycling plastics in many cases does not save resources because the power and water needed to recycle do not produce a net savings of resources. A third view of the effects of recycling is more about the effect of creating an awareness of consumption practices.

The above example takes a very small part of the recycling issue, whether recycling plastics saves resources, and identifies opposite viewpoints of the **effects** of the issue. This argument could also be very easily classified as a **fact** stasis question, since basic facts are in question. Either stasis you choose to call it, it's important to see how a narrow question will yield a more specific discussion of the issue.

Value

Questions on the **value** stasis deal with how widespread, severe, pervasive, beneficial, or important an issue is. An example is a piece by Nellie Bowles called "A Dark Consensus About Screens and Kids Begins to Emerge in Silicon Valley." This article that appeared in *The New York Times* can be classified as a **value** stasis argument because it addresses how serious the issue of children's screen use is to the parents creating the technology. Bowles reports that an increasing number of tech executives and programmers—the ones responsible for the apps and the devices to run them—are limiting and even forbidding screen time for their children. Here are the viewpoints presented:

> Viewpoint 1) Any amount of screen time is absolutely harmful to children.

> Viewpoint 2) Screen time isn't a concern. Today's screen time is similar to excessive television watching of previous decades and there are plenty of adults today who grew up watching a lot of television and turned out just fine.
>
> Viewpoint 3) Screen time has advantages and drawbacks and should be used with careful purpose and be strictly monitored.

Bowles' article is an excellent example of a real-life Viewpoint Synthesis assignment. Here's how the views can be summed up:

> How safe is screen time for children? Bowles quotes experts such as Chris Anderson, the former editor of *Wired* and now the chief executive of a robotics and drone company, who says of screens and children's brains, "On the scale between candy and crack cocaine, it's closer to crack cocaine." Another view, however, shows screens aren't a concern. Bowles quotes Jason Toff, who ran the Vine and now works for Google, and lets his 3-year-old play on an iPad, which he believes is no better or worse than a book. Bowles also shows the middle ground of other Silicon Valley parents who say there are ways to allow some limited educational screen time.

A paper showing just how dangerous (or not) screen time is for children would go on to explain each of the views in detail, using sources in addition to the Bowles article.

Policy

Issues of **policy** answer the question *what should be done?* Suppose your workplace has a problem with workers not showing for their shifts. You decide to research that question and find the following solutions:

> Viewpoint 1) Punish absenteeism. Decrease salaried workers' pay for absences not cleared 48 hours in advance. Allow only X number of sick days. Write up non-salaried workers for missing shifts and give only one warning before terminating employment.
>
> Viewpoint 2) Consider the causes of absenteeism and solve the problem by offering childcare and sick rooms for children of workers. Also, offer free bus passes or Uber credits.
>
> Viewpoint 3) Focus on productivity not attendance. Abolish the attendance policy. Allow workers to take off any time they need as long as their work is done. For workers who must be present for customer-service work, offer bonuses instead of flexible schedules.

For our Viewpoint Synthesis/Issue Exploration assignment, you need three distinct views. The perspectives should offer views that cannot all co-exist. Notice how in the absenteeism example, Viewpoint 1 focuses on solving the problem punitively while Viewpoint 3 makes absenteeism a non-issue by focusing on productivity. These viewpoints are mutually exclusive and cannot both be implemented. Your task is to find at least two views for your own issue that are mutually exclusive. The third view could be the middle ground.

Note: Sometimes after identifying several potential policies, your topic may seem too broad. At this point, it may be helpful to focus your research question on only one of the solutions at the **cause & effect** stasis. For example:

> Viewpoint 1) Yes, because _____.

Viewpoint 2) Yes, because of an entirely different reason.

Viewpoint 3) No, because ____.

Conclusion

Cleaning up your toys when you were six may not have been pleasant, but you can't deny the exhilarating feeling of accomplishment once it was done. When you finally see how you're going to organize your Issue Exploration, you'll feel a similar sense of achievement. Being able to classify the type of arguments *is* pretty satisfying. Almost as satisfying as having all your Polly Pockets together on the same shelf.

A note to instructors and other interested parties: A quick Google search of *stasis theory* or a perusal of *Purdue Owl* will usually show four stases of arguments: Fact, Definition, Quality, and Policy. Another classification includes three stases: Fact, Value, and Policy. Because stasis theory is useful in narrowing and classifying topics, I prefer the divisions given by rhetoricians like Grant-Davie, Secor, and Fahnestock of dividing arguments into five stases.

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Attributions

3.

STASIS THEORY

by John R. Edlund

In many ways, our world is utterly different from the civilizations of the ancient Greeks and Romans. We have vastly superior technology, different values and beliefs, art forms that no Roman ever imagined, and different ideas about gender roles and sexuality. However, our legislative and governing institutions have their roots in Greek and Roman ideas of democracy and civic life. Some aspects of human life haven't changed much in the past 2,000 years. Because humans are still humans, some ancient techniques for discussing problems and arriving at solutions are still very useful for coming up with good arguments. Among them is a technique called "stasis theory." Don't be put off by the technical sounding name. It really isn't that complicated.

Stasis theory was first developed by Hermagoras, a Greek rhetorician who taught in Rome during the first century B.C. The techniques were refined by Roman rhetoricians Cicero and Quintilian and used for many centuries to invent arguments for debates, persuasive speeches, and trials.

The first step in having a productive debate or discussion is to agree on the question being discussed. Quintilian says, "Every question is based on assertion by one party and denial by another" (III vi 6). However, a lot of questions are never resolved because the two sides are not asserting and denying the same question. For example, in the debate about abortion, the "pro-life" side generally asserts that "Abortion is murder," while the "pro-choice" side argues that "Women have a right to choose what happens to their own bodies." These parties cannot productively debate until they agree on what question they are debating. "Stasis" is a standpoint between two opposing views. "Achieving stasis" is when the parties reach agreement on exactly what the question or issue under discussion is.

The second step is to figure out where there is common ground and where there is disagreement about the issue. This is where the four stasis questions come into play. Do we disagree about the facts, the definition of the act (what to call it), the nature of the act (whether it was good or bad), or what to do about it? Once we figure out what the issue is and where we disagree, we can have an efficient and productive discussion about it. An unproductive discussion is often a lot of noise and shouting that doesn't go anywhere. Thinking through the stasis process helps clarify the issues so that we can zero in on the real problem. More on this below.

Definite and Indefinite Questions

Quintilian says that questions are either definite or indefinite. Indefinite, or general, questions can be argued without reference to a particular person, time, or place. Definite questions, on the other hand, involve particular people, times, and places (Quintilian III v. 6-10).

A definite question is always encompassed by a larger indefinite question. For example, the Supreme Court case known as Brown versus the Board of Education arises with a definite question:

> Should Oliver Brown, living in Topeka, Kansas in 1952, be able to send his black daughter Linda to a white school in his neighborhood?

However, this definite question was reformulated by the court as an indefinite question that would apply throughout the country:

> Are segregated schools, even if the physical circumstances and other tangible factors may be equal, ever truly equal?

The court's answer to this question was "No." Supreme Court decisions often derive general principles from arguments about particular, definite questions. These cases then establish a precedent for decisions about other definite questions in lower courts.

It is often useful to think about the general question behind the definite question that arises from the particular circumstances of the immediate situation. The writer or speaker can then decide whether it is better to argue the general question or the definite one.

Stasis Questions

As noted above, if the first step is to ask, "What issue or problem are we debating?" the second step is to ask "Where do we disagree?" Cicero argues that "Every subject which contains in itself any controversy existing either in language or in disputation, contains a question either about a fact, or about a name, or about a class, or about an action" (*De Inventione* I viii). These are the four basic stasis questions:

- Question of Fact or Conjecture: Does it exist? Did it happen?
- Question of Definition: How can the act or event be defined? What should we call it?
- Question of Quality: What is the character of the act? Is it good or bad? (Or excusable because of the circumstances.)
- Question of Policy: What should we do about it?

The main purpose of these questions is to figure out where we disagree on the question at issue. In the ancient world, the stasis questions were often applied to legal questions and trials.

"I Shot the Sheriff"

For example, let's look at the situation of the persona in Bob Marley's "I Shot the Sheriff":

> I shot the sheriff, but I did not shoot the deputy.
>
> I shot the sheriff, but I did not shoot the deputy.
>
> All around in my home town
>
> They're trying to track me down.
>
> They say they want to bring me in guilty
>
> For the killing of a deputy,
>
> For the life of a deputy.

If the court were trying him for the murder of the sheriff, it is not a question of fact because he admits to the shooting. We would move on to the definition question. However, according to the song, the community thinks he is guilty of killing the deputy, which he denies. On the question of the deputy, the dispute actually is about the question "Did it happen?"

About the sheriff the speaker says,

> I shot the sheriff, but I swear it was in self-defense.

On the issue of the sheriff then, the question is one of definition. Is it correct to call this killing "self-defense"? He is trying to define his act as a form of justifiable homicide. Different states and jurisdictions have different definitions of murder, but they are usually something like this:

- First Degree Murder: intentional murder that is willful and premeditated
- Second Degree Murder: intentional murder that is not premeditated or planned
- Voluntary Manslaughter: a "crime of passion" with no planning or premeditation, committed in an extreme emotional state
- Involuntary Manslaughter: accidental death caused by negligence
- Justifiable Homicide: an intentional killing justified by the circumstances

After claiming the act was in self-defense, the speaker explains that the sheriff always hated him. He says that when "freedom came my way" he started out of town, but then saw Sheriff John Brown "aiming to shoot me down." A lot depends on what he means by "freedom came my way." Is this part of a jailbreak? No matter how much the sheriff hated him, can he claim "self-defense" if he shot the sheriff while escaping from jail?

The last verse says

> Reflexes got the better of me
>
> And what is to be must be.
>
> Every day the bucket goes to the well,
>
> But one day the bottom will drop out,

Yes, one day the bottom will drop out.

The line "reflexes got the better of me" suggests a different definition, perhaps involuntary manslaughter. However, the metaphor of the bucket going to the well everyday and the bottom finally dropping out, plus the idea that the sheriff had always hated him, suggest long standing grievances and ill will. The proper definition sounds more and more like second degree murder.

From that we move to the issue of quality, or "Was the killing just or unjust?" Questions of definition and quality necessarily overlap a bit. We have already questioned his definition of the act as "self-defense." Are there any other potentially mitigating circumstances? The only evidence we have in the song is his claim that the sheriff always hated him. Under this question, we might consider circumstances such as a father stealing bread to feed his children. It is still theft, but perhaps it was justified.

Finally, we get to the question of policy, "What should we do about it?" which in this case would be "What should the sentence be?" Does this speaker deserve the death penalty? Life in prison? Or should we accept his "self-defense" definition and let him go?

Forensic and Deliberative Stasis

The most common use of stasis theory is in forensic cases like the one above, which means that we are arguing about some past act, often a crime of some kind. We are trying to determine if the act happened, what we should call it, the nature of the act, and what we should do about it. However, the stasis process can also be applied to deliberative questions (to "deliberate" means to consider various possibilities to reach a decision). In this case, we are considering a solution to a problem and what the future effects will be. According to George Pullman, the deliberative questions are

- Is it legal?
- Is it expedient? (Is action necessary and will it solve the problem?)
- Is it possible?
- What is the anticipated effect? (honor, happiness, satisfaction, etc.) (227)

These are questions that are asked in legislative bodies, from the U. S. Congress to city councils across the country, on a daily basis. They can be applied to everything from a proposal to repair a bridge to national tax policy.

Conclusion

In many cases, we waste a lot of time arguing without a clearly formulated question and without clear ideas of what the disagreement is about. Stasis theory provides a good framework for a productive discussion that actually has a chance of addressing and potentially solving real problems. On almost any issue, the stasis questions, which are easy to remember and use, will give you lots of material to talk about. And who knows, you might win the argument!

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4.

MODIFYING STASIS THEORY FOR THE CLASSROOM

by John R. Edlund

I recently had a discussion with one of my ERWC colleagues about the proper way to use stasis theory. The technique develops out of courtroom practices and is used primarily to locate the points of disagreement so that a trial can proceed efficiently. In this forensic use, the parties are debating the nature of a past act and what should be done about it. The process can be modified a bit to deal deliberatively with the effectiveness of a particular policy on future conditions. In either case, the first step is to get the parties to agree on the question at issue, a process which is called "achieving stasis." Then the stasis questions are used to figure out where the disagreement lies. The result is a lot of clear thinking and efficient progress towards a resolution of the problem.

The problem for teachers and students in the application of this process is that we are not in a courtroom trying a case or in a deliberative body deciding whether or not to implement a particular policy. Instead, we are using stasis theory as an analytical tool to get to the heart of a social issue or personal problem. We have to modify the tool a bit to make it work in the classroom.

Achieving stasis by agreeing on the question under discussion is an important first step. However, as my colleague pointed out, in an ERWC module and in general when we are discussing several texts on a particular issue, it is rare that the authors have defined the issue in the same way. They are often answering different, but related questions. Stasis theory helps us see that, but we do not have the power to bring the authors together to agree on the question. What do we do? I have summarized our discussion in this chart:

Reconsidering Stasis Theory		
	Traditional Use	**Modified Classroom Use**
Stasis Question	Parties agree on the question at issue.	What question is the author trying to answer? Is this an important question to ask at this time? Are there other more important questions to ask?
Fact	Do the parties disagree about the facts of the case? If so, debate begins here.	What facts are disputable in this situation? How can these disputed facts be resolved?
Definition	If there is agreement about the facts, do the parties disagree about how to define the act?	How do different parties define the issue? Which definition would you support and why?
Quality	If the act was committed, was it virtuous or immoral? Were there extenuating circumstances?	What values are in conflict in this situation? What values do you think should be applied?
Policy	What should we do about this act or the person who committed it?	What do different parties think should be done? What do you think should be done?

Figure 4.1

As noted in Figure 4.1, one approach is to tease out the questions that the authors are really trying to answer and analyze the differences that result when we try to apply the stasis questions to each approach. This would bring considerable clarity to the discussion and would make a good paper in itself. This process might begin by asking of each author, "What question is he or she trying to answer?"

Another approach is for the student (or the teacher) to pose the question that they think should actually be asked and then use the stasis questions to explore how the different parties to the discussion disagree. For example, on the Declaration of Independence, I might ask the following stasis question:

> Did George III actually do all of the terrible things of which he is accused in the Declaration of Independence?

Possible responses might be

- Fact: The parties actually disagree about this. The British say that these alleged "crimes" are all acts of parliament. The British would actually be right about this and Thomas Jefferson knows it. They are scapegoating the king for rhetorical effect and to address the problem of declaring themselves no longer subjects of the king. They have to make the king an unfit ruler. But nobody really disagrees that these things have been done.
- Definition: The colonists say these acts are examples of tyranny, while the British say it is just governance.
- Quality: This really comes down to intentions. The colonists say that these tyrannous acts

are designed to hinder and control self-governance in order to hamstring the colonies and keep them from becoming independent and powerful. The British say that they are governing the colonies and protecting them from harm.

- Policy: The colonists say that such acts justify rebellion. The British wage war in response.

If we try a more philosophical question such as "Are all men (and women) created equal?" we see that things get interesting and complicated very quickly. The British immediately say, "You've got to be kidding. You are a bunch of slave holders." Then we are going to get into race, social class, economic inequality, land owners versus renters, cultural practices, and a host of other things. What the founders meant was that they were going to get rid of the nobility, that there would no longer be lords and commoners. The British say, "Good luck with that."

When it comes to definition, we might say that the Declaration is "aspirational" in that it proposes ideal principles that the colonies have not yet achieved. The British call the document "hypocritical." On the face of it, the British are right. It does seem hypocritical to say that "all men are created equal" while holding slaves. Questions of quality are going to hinge on those definitions. Does the Declaration represent aspirational idealism or hypocritical self-interest?

About policy? Well, the aspirational view won out and we ended up with a constitution. We are still trying to meet the principled ideals of the Declaration, but we have made progress.

One of the new modules to be introduced in ERWC is built around a novel, *The Curious Incident of the Dog in the Night-Time* by Mark Haddon. It is a murder mystery, which would seem to make it ideal for the application of forensic stasis theory. However, in this case, we are doing literary criticism and exploring some of the issues raised by the novel (Full disclosure: I haven't read the novel yet. I am guessing from the Wikipedia entry and a picture of the cover). One question in the story is "Who killed the dog?" The stasis questions might lead to some larger philosophical and ethical issues:

- Fact: A dog is dead. Did someone kill it?
- Definition: Is killing a dog murder?
- Quality: Was killing the dog necessary because it was mean, sick, or dangerous? Or was it an act of revenge or cruelty?
- Policy: Should dog murderers go to jail?

Here, the stasis questions are helping us define one of the acts in the novel.

One of the questions that came up in our discussion was "Can you use the stasis questions as an invention strategy or brainstorming tool to generate lots of possible questions to explore?" As I noted above, we have to modify the stasis tool because we are not in the same situations for which it was originally designed. Use as a sort of focused brainstorming tool is certainly possible. In that case, we might ask

- What facts are disputable in this situation?
- How do different parties define the issue?

- What values are in conflict in this situation?
- What do different parties think should be done?

There are lots of ways to use stasis theory. In almost any situation, it will help us think about questions, facts, definitions, values, and policies.

Attributions

PART II

REASONING

5.

WHAT IS THE RHETORICAL SITUATION?

by Robin Jeffrey and Emilie Zickel

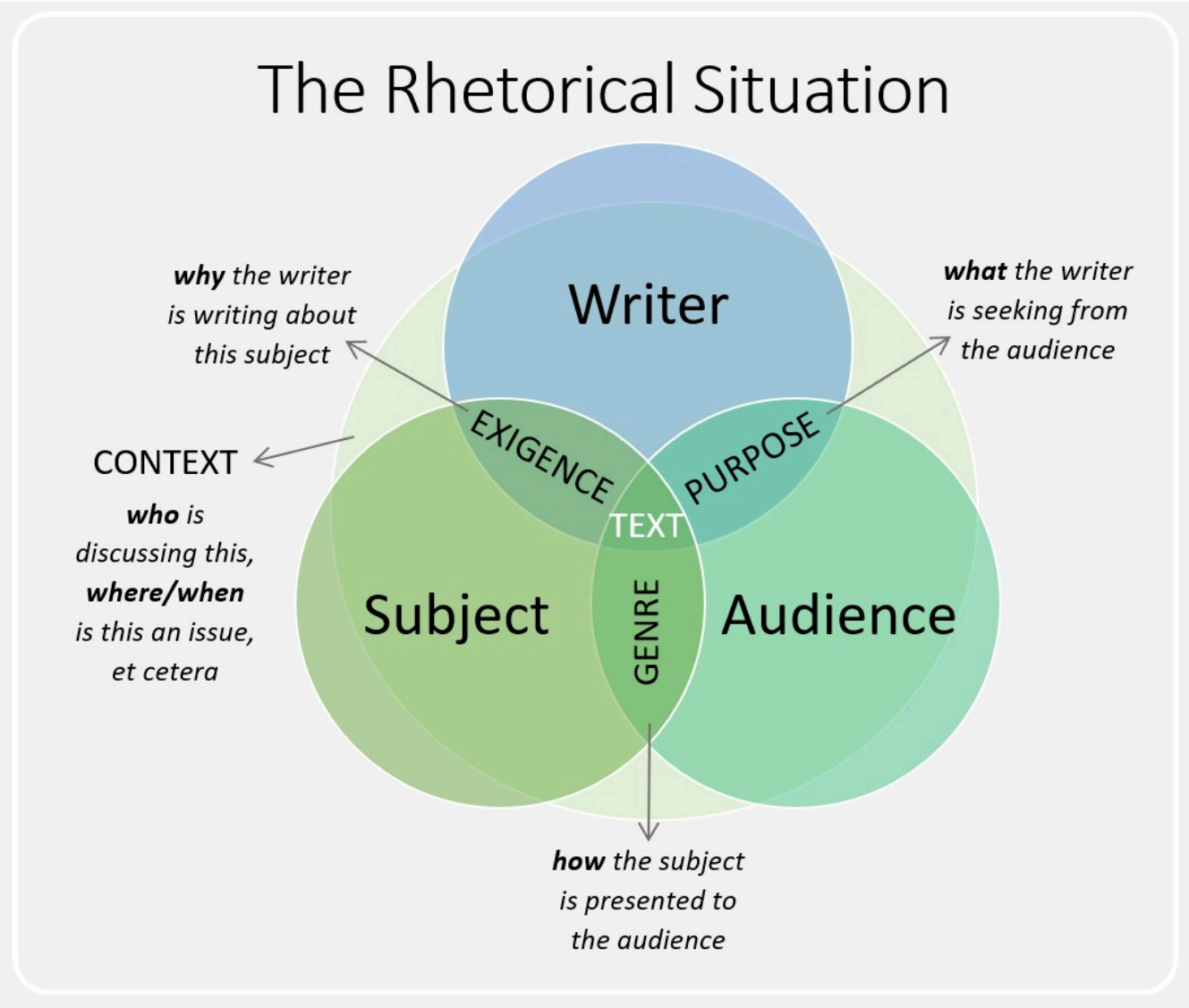

Figure 5.1: A Visual Model of The Rhetorical Situation

A key component of rhetorical analysis involves thinking carefully about the "rhetorical situation" of a text (see Figure 5.1). You can think of the rhetorical situation as the context or set of circumstances out of which a text arises. Any time anyone is trying to make an argument, one is doing so out of a particular context, one that influences and shapes the argument that is made. When we do a rhetorical analysis, we look carefully at how the rhetorical situation (context) shapes the rhetorical act (the text).

We can understand the concept of a rhetorical situation if we examine it piece by piece, by looking carefully at the rhetorical concepts from which it is built. The philosopher Aristotle organized these concepts as author, audience, setting, purpose, and text. Answering the questions about these rhetorical concepts below will give you a good sense of your text's rhetorical situation – the starting point for rhetorical analysis.

We will use the example of President Trump's inaugural address (the text) to sift through these questions about the rhetorical situation (context).

Author or Writer

The "author" of a text is the creator – the person who is communicating in order to try to effect a change in his or her audience. An author doesn't have to be a single person or a person at all – an author could be an organization. To understand the rhetorical situation of a text, one must examine the identity of the author and his or her background. Ask the following questions:

- What kind of experience or authority does the author have in the subject about which he or she is speaking?
- What values does the author have, either in general or regarding this particular subject?
- How invested is the author in the topic of the text? In other words, what affects the author's perspective on the topic?

Here's an example of author analysis for the rhetorical situation using President Trump's Inaugural Address:

> President Trump was a first-term president and someone who had not previously held political office. He did not yet have experience with running the country. He is, however, a wealthy businessman and had a great deal of experience in the business world. His political affiliation is with the Republican party–the conservative political party in America.

Audience

In any text, an author is attempting to engage an audience. Before we can analyze how effectively an author engages an audience, we must spend some time thinking about that audience. An audience is any person or group who is the intended recipient of the text and also the person/people the author is trying to influence. To understand the rhetorical situation of a text, one must examine who the intended audience is by thinking about these things:

- Who is the author addressing? Sometimes this is the hardest question of all. We can get this information of "who is the author addressing" by looking at where an article is published. Be

sure to pay attention to the newspaper, magazine, website, or journal title where the text is published. Often, you can research that publication to get a good sense of who reads that publication.

- What is the audience's demographic information (age, gender, etc.)?
- What is/are the background, values, and interests of the intended audience?
- How open is this intended audience to the author?
- What assumptions might the audience make about the author?
- In what context is the audience receiving the text?

Here's an example of audience analysis for the rhetorical situation using President Trump's Inaugural Address:

> Inaugural addresses are delivered to "the American people"; one can assume that all Americans are the intended audience. However, Americans were divided at the moment of President Trump's election, with some voters very happy that he was elected and others upset by it. Those opinions tended to split along party lines: Republicans tended to support Trump, whereas Democrats were critical of him. Republicans may have been making the assumption that President Trump would be a great leader; Democrats were likely making the assumption that he would be a bad leader. As a candidate, President Trump (like all political candidates) spent most of his time in speeches trying to rally his base of supporters (his audience – Republican voters). In the inaugural address, he knew that his intended audience, his Republican base, was watching and listening with support. But there may be others who were watching his speech who were not a part of the intended audience, and as president, he likely wished to engage and to reach out to even the Democrats who rejected him.

Context

Nothing happens in a vacuum, and that includes the creation of any text. Essays, speeches, photos, political ads–any text–were written in a specific time and/or place, all of which could affect the way the text communicates its message. To understand the rhetorical situation of a text, we can identify the particular occasion or event that prompted the text's creation at the particular time it was created. Ask the following questions for context in a rhetorical situation:

- Was there a debate about the topic that the author of the text addresses? If so, what are (or were) the various perspectives within that debate?
- Did something specific occur that motivated the author to speak out?

Here's an example of setting analysis for the rhetorical situation using President Trump's Inaugural Address:

> The occasion of President Trump giving this speech is his election to the presidency. All presidents are expected to give a speech at their inauguration; therefore, the newly elected President Trump was required to give one.

Purpose

The purpose of a text blends the author with the setting and the audience. Looking at a text's purpose means looking at the author's motivations for creating it. The author has decided to start a conversation or join one that is already underway. Why has he or she decided to join in? In any text, the author may be trying to inform, to convince, to define, to announce, or to activate. Can you tell which one of those general purposes your author has? To determine the purpose, ask the following questions:

- What is the author hoping to achieve with this text?
- Why did the author decide to join the "conversation" about the topic?
- What does the author want from their audience?
- What does the author want the audience to do once the text is communicated?

Here's an example of purpose analysis for the rhetorical situation using President Trump's Inaugural Address:

> President Trump's purpose in the inaugural address was to set the tone for his presidency, to share his vision with Americans, and to attempt to unite the country and prepare it for moving forward with his agenda.

Text

Ask the following questions about the text itself:

- In what format or medium is the text being made: image? written essay? speech? song? protest sign? meme? sculpture?
- What is gained by having a text composed in a particular format/medium?
- What limitations does that format/medium have?
- What opportunities for expression does that format/medium have (that perhaps other formats do not have)?

Here's an example of text analysis for the rhetorical situation using President Trump's Inaugural Address:

> Inaugural addresses are expected for each president. They are delivered in Washington DC – always in the same spot. The tone is formal. Inaugural addresses generally lay out a vision for the incoming president's term.

A Note about Audience: What is the Difference between an Audience and a Reader?

Thinking about audience can be a bit tricky. Your audience is the person or group that you intend to reach with your writing. We sometimes call this the "intended audience"–the group of people to whom a text is intentionally directed. But any text likely also has an unintended audience, a reader (or readers) who read it even without being the intended recipient. The reader might be the person you have in mind as you write, the audience you're trying to reach, but they might be some random person

you've never thought of a day in your life. You can't always know much about random readers, but you should have some understanding of who your audience is. It's the audience that you want to focus on as you shape your message.

Attributions:

Visual:

6.

RHETORICAL APPEALS: LOGOS, PATHOS, AND ETHOS DEFINED

by Melanie Gagich and Emilie Zickel

Rhetoric is the way that authors use and manipulate language in order to persuade an audience. Once we understand the rhetorical situation out of which a text is created (why it was written, for whom it was written, by whom it was written, how the medium in which it was written creates certain constraints or perhaps freedoms of expression), we can look at how all of those contextual elements shape the author's creation of the text.

We can look first at the classical rhetorical appeals, which are the three ways to classify authors' intellectual, moral, and emotional approaches to getting the audience to have the reaction that the author hopes for.

Rhetorical Appeals

Rhetorical appeals refer to ethos, pathos, and logos. These are classical Greek terms, dating back to Aristotle, who is traditionally seen as the father of rhetoric. To be rhetorically effective (and thus persuasive), an author must engage the audience in a variety of compelling ways, which involves carefully choosing how to craft their argument so that the outcome, audience agreement with the argument or point, is achieved. Aristotle defined these modes of engagement and gave them the terms that we still use today: logos, pathos, and ethos.

Logos: Appeal to Logic

Logic. Reason. Rationality. Logos is brainy and intellectual, cool, calm, collected, objective.

When an author relies on logos, it means that they are using logic, careful structure, and objective evidence to appeal to the audience. An author can appeal to an audience's intellect by using information that can be fact checked (using multiple sources) and thorough explanations to support key points. Additionally, providing a solid and non-biased explanation of one's argument is a great way for an author to invoke logos.

For example, if I were trying to convince my students to complete their homework, I might explain that I understand everyone is busy and they have other classes (non-biased), but the homework will help them get a better grade on their test (explanation). I could add to this explanation by providing statistics showing the number of students who failed and didn't complete their homework versus the number of students who passed and did complete their homework (factual evidence).

Logical appeals rest on rational modes of thinking**,** such as

- **Comparison –** including a comparison between one thing (with regard to your topic) and another similar thing to help support your claim. It is important that the comparison is fair and valid–the things being compared must share significant traits of similarity.
- **Cause/effect thinking –** arguing that X has caused Y, or that X is likely to cause Y to help support your claim. Be careful with the latter–it can be difficult to predict that something will happen in the future.
- **Deductive reasoning –** starting with a broad, general claim/example and using it to support a more specific point or claim
- **Inductive reasoning –** using several specific examples or cases to make a broad generalization
- **Exemplification –** using many examples or a variety of evidence to support a single point
- **Elaboration** – moving beyond just including a fact but explaining the significance or relevance of that fact
- **Coherent thought** – maintaining a well-organized line of reasoning; not repeating ideas or jumping around

Pathos: Appeal to Emotions

When an author relies on pathos, it means that they are trying to tap into the audience's emotions to get them to agree with the author's claim. An author using pathetic appeals wants the audience to feel something: anger, pride, joy, rage, or happiness. For example, many of us have seen the ASPCA commercials that use photographs of injured puppies or sad-looking kittens and slow, depressing music to emotionally persuade their audience to donate money.

Pathos-based rhetorical strategies are any strategies that get the audience to "open up" to the topic, the argument, or the author. Emotions can make us vulnerable, and an author can use this vulnerability to get the audience to believe that their argument is a compelling one.

Pathetic appeals might include

- **Expressive descriptions** of people, places, or events that help the reader to feel or experience those events
- **Vivid imagery** of people, places, or events that help the reader to feel like they are seeing those events
- **Personal stories** that make the reader feel a connection to, or empathy for, the person being

described

- **Emotion-laden vocabulary** as a way to put the reader into that specific emotional mindset (What is the author trying to make the audience feel? And how are they doing that?)
- Information that will **evoke an emotional response from the audience**. This could involve making the audience feel empathy or disgust for the person/group/event being discussed or perhaps connection to or rejection of the person/group/event being discussed.

When reading a text, try to locate when the author is trying to convince the reader using emotions because, if used to excess, pathetic appeals can indicate a lack of substance or emotional manipulation of the audience. See the links below about fallacious pathos for more information.

Ethos: Appeal to Values/Trust

Ethical appeals have two facets: audience values and authorial credibility/character.

On the one hand, when an author makes an ethical appeal, they are attempting to **tap into the values or ideologies that the audience holds**, for example, patriotism, tradition, justice, equality, dignity for all humankind, self-preservation, or other specific social, religious or philosophical values (Christian values, socialism, capitalism, feminism, etc.). These values can sometimes feel very close to emotions, but they are felt on a social level rather than only on a personal level. When an author evokes the values that the audience cares about to justify or support their argument, we classify that as ethos. The audience will feel that the author is making an argument that is "right" (in the sense of moral "right"-ness, i.e., "My argument rests upon the values that matter to you. Therefore, you should accept my argument"). This first part of the definition of ethos, then, is focused on the audience's values.

On the other hand, this sense of referencing what is "right" in an ethical appeal connects to the other sense of ethos: the author. Ethos that is centered on the author revolves around two concepts: the credibility of the author and their character.

- **Credibility** of the speaker/author is determined by their knowledge and expertise in the subject at hand. For example, if you are learning about Einstein's Theory of Relativity, would you rather learn from a professor of physics or a cousin who took two science classes in high school 30 years ago? It is fair to say that, in general, the professor of physics would have more credibility to discuss the topic of physics. To establish their credibility, an author may draw attention to who they are or what kinds of experience they have with the topic being discussed as an ethical appeal (i.e., "Because I have experience with this topic–and I know my stuff– you should trust what I am saying about this topic"). Some authors do not have to establish their credibility because the audience already knows who they are and that they are credible.
- **Character** is another aspect of ethos. Character is different from credibility because it involves personal history and even personality traits. A person can be credible but lack character or vice versa. For example, in politics, sometimes the most experienced candidates–those who might be the most credible candidates–fail to win elections because

> voters do not accept their character. Politicians take pains to shape their character as leaders who have the interests of the voters at heart. The candidate who successfully proves to the voters (the audience) that they have the type of character that the audience can trust is more likely to win.

Thus, ethos comes down to trust. How can the author gain the audience's trust so that the audience will accept their argument? How can the author make him or herself appear as a credible speaker who embodies the character traits that the audience values? In building ethical appeals, we see authors referring either directly or indirectly to the values that matter to the intended audience (so that the audience will trust the speaker). Authors use language, phrasing, imagery, or other writing styles common to people who hold those values, thereby "talking the talk" of people with those values (again, so that the audience is inclined to trust the speaker). Authors refer to their experience and/or authority with the topic as well (and therefore demonstrate their credibility).

When reading, you should think about the author's credibility regarding the subject as well as their character. Here is an example of a rhetorical move that connects with ethos: when reading an article about abortion, the author mentions that she has had an abortion. That is an example of an ethical move because the author is creating credibility via anecdotal evidence and first-person narrative. In a rhetorical analysis project, it would be up to you, the analyzer, to point out this move and associate it with a rhetorical strategy.

Rhetorical Appeals Misuse

When writers misuse logos, pathos, or ethos, arguments can be weakened. Above, we defined and described what logos, pathos, and ethos are and why authors may use those strategies. Sometimes, using a combination of logical, pathetic, and ethical appeals leads to a sound, balanced, and persuasive argument. It is important to understand, though, that using rhetorical appeals does not always lead to a sound, balanced argument. In fact, any of the appeals could be misused or overused. And when that happens, arguments can be weakened.

To see what a misuse of logical appeals might consist of, see Logical Fallacies.

To see how authors can overuse emotional appeals and turn-off their target audience, visit the following link from *WritingCommons.org*: Fallacious Pathos.

To see how ethos can be misused or used in a manner that may be misleading, visit the following link to *WritingCommons.org*: Fallacious Ethos

Attributions

7.

CLASSICAL RHETORIC

by Rebecca Jones

Introduction

In James Murphy's translation of Quintilian's *Institutio Oratoria*, he explains that "Education for Quintilian begins in the cradle, and ends only when life itself ends" (xxi). The result of a life of learning, for Quintilian, is a perfect speech where "the student is given a statement of a problem and asked to prepare an appropriate speech giving his solution" (Murphy xxiii). In this version of the world, a good citizen is always a PUBLIC participant. This forces the good citizen to know the rigors of public argumentation: "Rhetoric, or the theory of effective communication, is for Quintilian merely the tool of the broadly educated citizen who is capable of analysis, reflection, and powerful action in public affairs" (Murphy xxvii). For Quintilian, learning to argue in public is a lifelong affair. He believed that the "perfect orator . . . cannot exist unless he is above all a good man" (6). Whether we agree with this or not, the hope for ethical behavior has been a part of public argumentation from the beginning.

The ancient model of rhetoric (or public argumentation) is complex. As a matter of fact, there is no single model of ancient argumentation. Plato claimed that the Sophists, such as Gorgias, were spin doctors weaving opinion and untruth for the delight of an audience and to the detriment of their moral fiber. For Plato, at least in the Phaedrus, public conversation was only useful if one applied it to the search for truth. In the last decade, the work of the Sophists has been redeemed. Rather than spin doctors, Sophists like Isocrates and even Gorgias, to some degree, are viewed as arbiters of democracy because they believed that many people—not just male, property holding, Athenian citizens—could learn to use rhetoric effectively in public.

Aristotle gives us a slightly more systematic approach. He is very concerned with logic. For this reason, much of what is discussed below comes from his work. Aristotle explains that most men participate in public argument in some fashion. It is important to note that by "men," Aristotle means citizens of Athens: adult males with the right to vote, not including women, foreigners, or slaves. Essentially this is a homogenous group by race, gender, and religious affiliation. We have to keep this in mind when adapting these strategies to our current heterogeneous culture. Aristotle explains,

> . . . for to a certain extent all men attempt to discuss statements and to maintain them, to defend themselves and to attack others. Ordinary people do this either at random or through practice and from acquired habit. Both ways being possible, the subject can plainly be handled systematically, for it is possible to inquire the reason why some speakers succeed through practice and others spontaneously; and every one will at once agree that such an inquiry is the function of an art. (Honeycutt, "Aristotle's *Rhetoric*" 1354a I i)

For Aristotle, inquiry into this field was artistic in nature. It required both skill and practice (some needed more of one than the other). Important here is the notion that public argument can be systematically learned.

Aristotle did not dwell on the ethics of an argument in rhetoric (he leaves this to other texts). He argued that "things that are true and things that are just have a natural tendency to prevail over their opposites" and finally that " . . . things that are true and things that are better are, by their nature, practically always easier to prove and easier to believe in" (Honeycutt, "Aristotle's Rhetoric" 1355a I i). As a culture, we are skeptical of this kind of position, though I think that we do often believe it on a personal level. Aristotle admits in the next line that there are people who will use their skills at rhetoric for harm. As his job in this section is to defend the use of rhetoric itself, he claims that everything good can be used for harm, so rhetoric is no different from other fields. If this is true, there is even more need to educate the citizenry so that they will not be fooled by unethical and untruthful arguments.

For many, logic simply means reasoning. To understand a person's logic, we try to find the structure of their reasoning. Logic is not synonymous with fact or truth, though facts are part of evidence in logical argumentation. You can be logical without being truthful. This is why more logic is not the only answer to better public argument.

Deductive and Inductive Reasoning

Our human brains are compelled to categorize the world as a survival mechanism. This survival mechanism allows for quicker thought. Two of the most basic logical strategies include inductive and deductive reasoning.

Deductive Reasoning

Deductive reasoning (see Figure 7.1) starts from a premise that is a generalization about a large class of ideas, people, etc. and moves to a specific conclusion about a smaller category of ideas or things (All cats hate water; therefore, my neighbor's cat will not jump in our pool). While the first premise is the most general, the second premise is a more particular observation. So the argument is created through common beliefs/observations that are compared to create an
argument. For example:

> People who burn flags are unpatriotic. **Major Premise**
> Sara burned a flag. **Minor Premise**
> Sara is unpatriotic. **Conclusion**

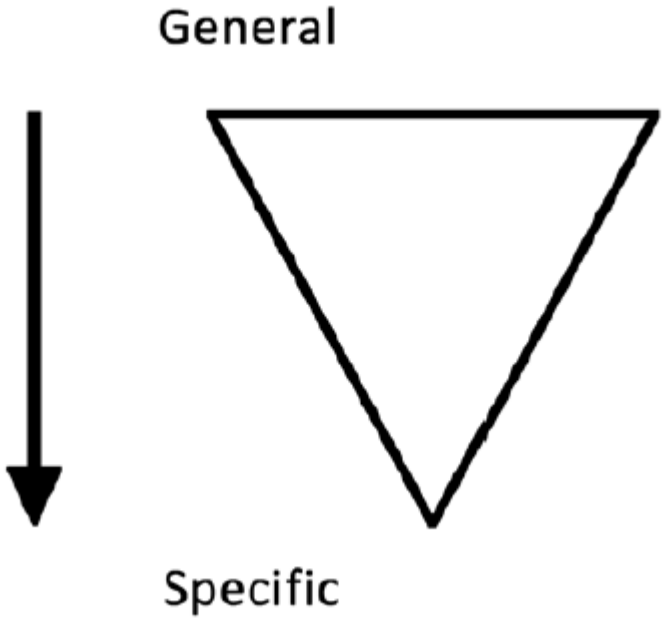

Figure 7.1: Deductive Reasoning

The above example is called a syllogism. As we can see in the example, the major premise offers a general belief held by some groups and the minor premise is a particular observation. The conclusion is drawn by comparing the premises and developing a conclusion. If you work hard enough, you can often take a complex argument and boil it down to a syllogism. This can reveal a great deal about the argument that is not apparent in the longer more complex version.

Stanley Fish, professor and *New York Times* columnist, offers the following syllogism in his July 22, 2007, blog entry titled "Democracy and Education":

> "The syllogism underlying these comments is (1) America is a democracy (2) Schools and universities are situated within that democracy (3) Therefore schools and universities should be ordered and administrated according to democratic principles."

Fish offered the syllogism as a way to summarize the responses to his argument that students do not, in fact, have the right to free speech in a university classroom. The responses to Fish's standpoint were vehemently opposed to his understanding of free speech rights and democracy. The responses are varied and complex. However, boiling them down to a single syllogism helps to summarize the primary rebuttal so that Fish could then offer his extended version of his standpoint (see link to argument in Question #1 at the end of the text).

Inductive Reasoning

Inductive reasoning moves in a different direction than deductive reasoning (see Figure 7.2). Inductive reasoning starts with a particular or local statement and moves to a more general conclusion. I think of inductive reasoning as a stacking of evidence. The more particular examples you give, the more it seems that your conclusion is correct.

Inductive reasoning is a common method for arguing, especially when the conclusion is an obvious probability. Inductive reasoning is the most common way that we move around in the world. If we experience something habitually, we reason that it will happen again. For example, if we walk down a city street and every person smiles, we might reason that this is a "nice town." This seems logical. We have taken many similar, particular experiences (smiles) and used them to make a general conclusion (the people in the town are nice). Most of the time, this reasoning works. However, we know that it can also lead us in the wrong direction. Perhaps the people were smiling because we were wearing inappropriate clothing (country togs in a metropolitan city), or perhaps only the people living on that particular street are "nice" and the rest of the town is unfriendly. Research papers sometimes rely too heavily on this logical method. Writers assume that finding ten versions of the same argument somehow prove that the point is true.

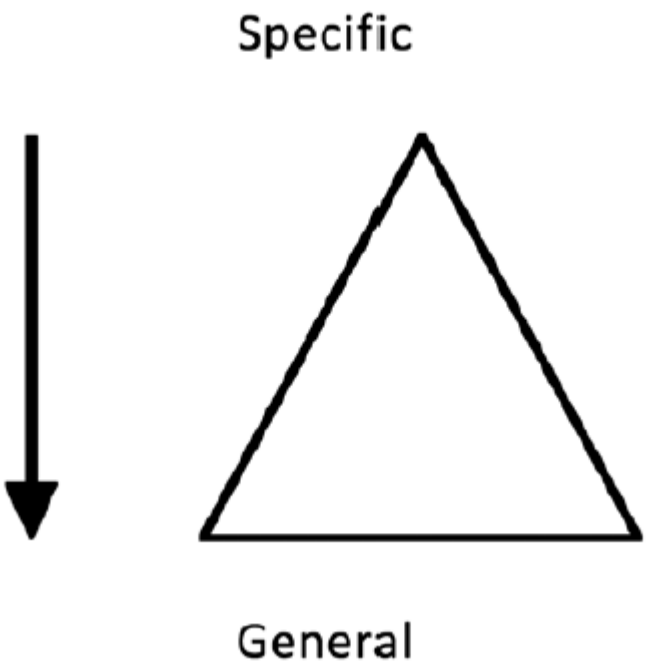

Figure 7.2: Inductive Reasoning

Here is another example. In Ann Coulter's most recent book, *Guilty: Liberal "Victims" and Their Assault on America*, she makes her (in)famous argument that single motherhood is the cause of many of America's ills. She creates this argument through a piling of evidence. She lists statistics by sociologists, she lists all the single moms who killed their children, she lists stories of single mothers who say outrageous things about their life, children, or marriage in general, and she ends with a list of celebrity single moms that most would agree are not good examples of motherhood. Through this list, she concludes, "Look at almost any societal problem and you will find it is really a problem of single mothers" (36). While she could argue, from this evidence, that being a single mother is difficult, the generalization that single motherhood is the root of social ills in America takes the inductive reasoning too far. Despite this example, we need inductive reasoning because it is the key to analytical thought (see Activity: Applying Deductive and Inductive Reasoning below). To write an "analysis paper" is to use inductive reasoning.

Activity: Applying Deductive and Inductive Reasoning

For each standpoint below, create a deductive argument AND an inductive argument. When you are finished, share with your group members and decide which logical strategy offers a more successful, believable, and/or ethical argument for the particular standpoint. Feel free to modify the standpoint to find many possible arguments.

- Affirmative Action should continue to be legal in the United States.
- Affirmative Action is no longer useful in the United States.
- The arts should remain an essential part of public education.
- Choose a very specific argument on your campus (parking, tuition, curriculum), and create deductive and inductive arguments to support the standpoint.

Most academic arguments in the humanities are inductive to some degree. When you study humanity, nothing is certain. When observing or making inductive arguments, it is important to get your evidence from many different areas, to judge it carefully, and to acknowledge the flaws. Inductive arguments must be judged by the quality of the evidence since the conclusions are drawn directly from a body of compiled work.

Attributions

PART III

ELEMENTS OF ARGUMENT

8.

TOULMIN ANALYSIS

(Claims and Data)

by Andrew Gurevich

Stephen Toulmin was a British philosopher, author, and educator. Influenced by Ludwig Wittgenstein, Toulmin devoted his works to the analysis of moral reasoning. Throughout his writings, he sought to develop practical arguments which can be used effectively in evaluating the ethics behind moral issues. His works were later found useful in the field of rhetoric for analyzing arguments and exploring their underlying assumptions.

The Toulmin Model

The Toulmin Model of Argumentation contains six interrelated components used for analyzing arguments:

- **Claim:** the position or claim being argued; the conclusion of the argument
- **Data/Grounds:** the reasons or supporting evidence that bolster the claim
- **Warrant:** the principle, provision, or chain of reasoning that connects the grounds/reason to the claim
- **Backing:** the support, justification, reasons to back up the warrant
- **Rebuttal/Reservation:** the exceptions to the claim; description and rebuttal of counterexamples and counterarguments
- **Qualification:** specification of limits to claim, warrant, and backing. The degree of conditionality asserted

Tips for Analyzing Arguments

- When looking for the **claim**, ask yourself the question, "What is the main idea of central

claim of this argument?"

- When looking for the **grounds**, ask yourself the question, "What are the reasons given to support the claim?"
- When looking for the **warrant**, ask yourself the question, "Why does the arguer believe this data proves this claim?"

Attributions

9.

TOULMIN ARGUMENT MODEL

by Liza Long, Amy Minervini, and Joel Gladd

Stephen Edelston Toulmin (born March 25, 1922) was a British philosopher, author, and educator. Toulmin devoted his works to analyzing moral reasoning. He sought to develop practical ways to evaluate ethical arguments effectively. The Toulmin Model of Argumentation, a diagram containing six interrelated components, was considered Toulmin's most influential work, particularly in the fields of rhetoric, communication, and computer science. His components continue to provide useful means for analyzing arguments.

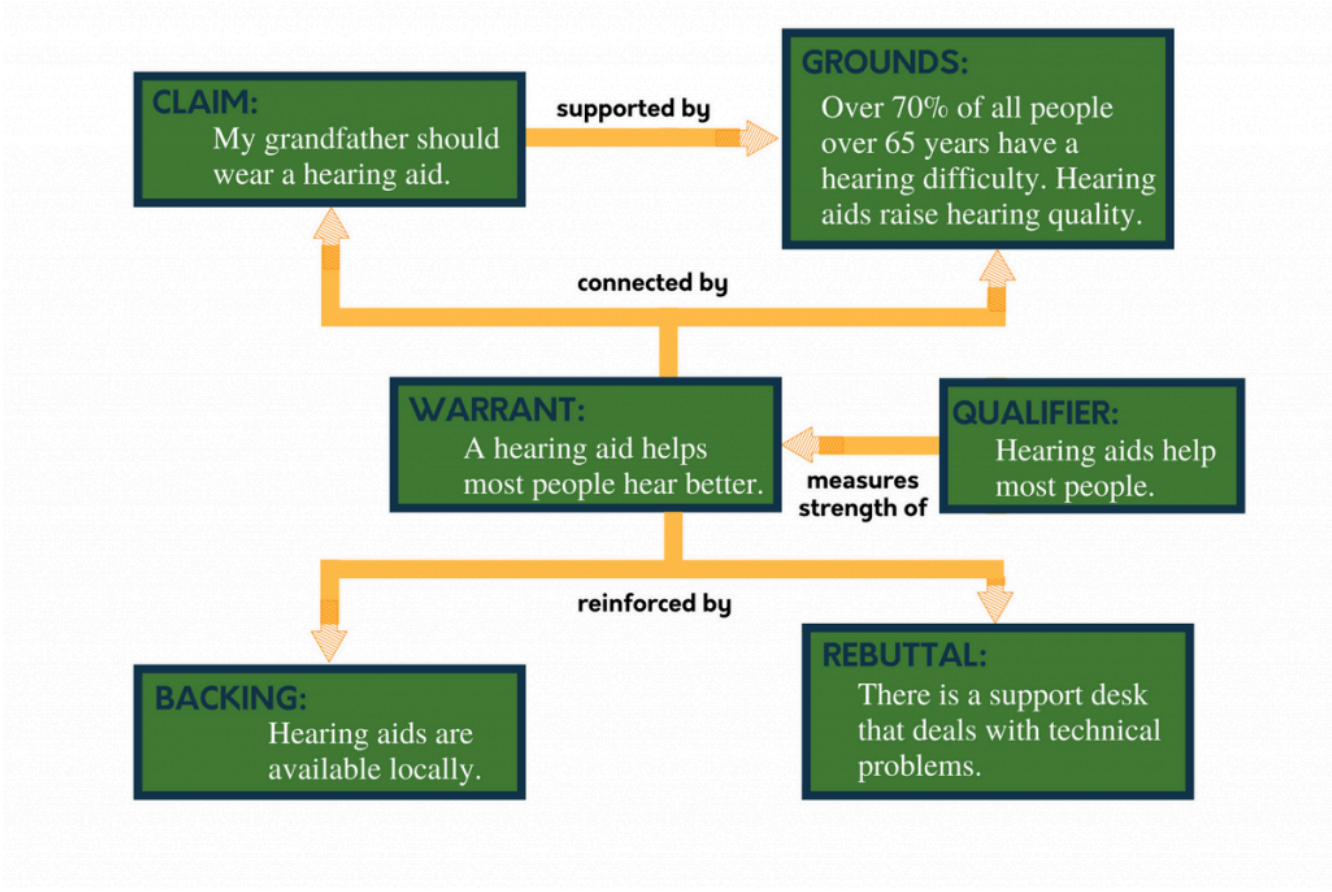

Figure 9.1: "Toulmin Argument," Kalyca Schultz, Virginia Western Community College, CC-BY-SA.

The following are the parts of a Toulmin argument (see Figure 9.1 for an example):

Claim: The claim is a statement that you are asking the other person to accept as true (i.e., a conclusion) and forms the nexus of the Toulmin argument because all the other parts relate back to the claim. The claim can include information and ideas you are asking readers to accept as true or actions you want them to accept and enact. One example of a claim is the following:

> My grandfather should wear a hearing aid.

This claim both asks the reader to believe an idea and suggests an action to enact. However, like all claims, it can be challenged. Thus, a Toulmin argument does not end with a claim but also includes grounds and warrant to give support and reasoning to the claim.

Grounds: The grounds form the basis of real persuasion and include the reasoning behind the claim, data, and proof of expertise. Think of grounds as a combination of premises and support. The truth of the claim rests upon the grounds, so those grounds should be tested for strength, credibility, relevance, and reliability. The following are examples of grounds:

> Over 70% of all people over 65 years have a hearing difficulty.
>
> Hearing aids raise hearing quality.

Information is usually a powerful element of persuasion, although it does affect people differently. Those who are dogmatic, logical, or rational will more likely be persuaded by factual data. Those who argue emotionally and who are highly invested in their own position will challenge it or otherwise try to ignore it. Thus, grounds can also include appeals to emotion, provided they aren't misused. The best arguments, however, use a variety of support and rhetorical appeals.

Warrant: A warrant links data and other grounds to a claim, legitimizing the claim by showing the grounds to be relevant. The warrant may be carefully explained and explicit or unspoken and implicit. The warrant answers the question, "Why does that data mean your claim is true?" For example,

> A hearing aid helps most people hear better.

The warrant may be simple, and it may also be a longer argument with additional sub-elements including those described below. Warrants may be based on logos, ethos or pathos, or values that are assumed to be shared with the listener. In many arguments, warrants are often implicit and, hence, unstated. This gives space for the other person to question and expose the warrant, perhaps to show it is weak or unfounded.

Backing: The backing for an argument gives additional support to the warrant. Backing can be confused with grounds, but the main difference is this: grounds should directly support the premises of the main argument itself, while backing exists to help the warrants make more sense. For example,

> Hearing aids are available locally.

This statement works as backing because it gives credence to the warrant stated above, that a hearing aid will help most people hear better. The fact that hearing aids are readily available makes the warrant even more reasonable.

Qualifier: The qualifier indicates how the data justifies the warrant and may limit how universally the claim applies. The necessity of qualifying words comes from the plain fact that most absolute claims are ultimately false (all women want to be mothers, e.g.) because one counterexample sinks them immediately. Thus, most arguments need some sort of qualifier, words that temper an absolute claim and make it more reasonable. Common qualifiers include "most," "usually," "always," or "sometimes." For example,

> Hearing aids help most people.

The qualifier "most" here allows for the reasonable understanding that rarely does one thing (a hearing aid) universally benefit all people. Another variant is the **reservation,** which may give the possibility of the claim being incorrect:

> Unless there is evidence to the contrary, hearing aids do no harm to ears.

Qualifiers and reservations can be used to bolster weak arguments, so it is important to recognize them. They are often used by advertisers who are constrained not to lie. Thus, they slip "usually," "virtually," "unless," and so on into their claims to protect against liability. While this may seem like sneaky practice, and it can be for some advertisers, it is important to note that the use of qualifiers and reservations can be a useful and legitimate part of an argument.

Rebuttal: Despite the careful construction of the argument, there may still be counterarguments that can be used. These may be rebutted either through a continued dialogue, or by pre-empting the counter-argument by giving the rebuttal during the initial presentation of the argument. For example, if you anticipated a counterargument that hearing aids, as a technology, may be fraught with technical difficulties, you would include a rebuttal to deal with that counterargument:

> There is a support desk that deals with technical problems.

Any rebuttal is an argument in itself, and thus may include a claim, warrant, backing, and the other parts of the Toulmin structure.

Even if you do not wish to write an essay using strict Toulmin structure, using the Toulmin checklist can make an argument stronger. When first proposed, Toulmin based his layout on legal arguments, intending it to be used analyzing arguments typically found in the courtroom; in fact, Toulmin did not realize that this layout would be applicable to other fields until later. The first three elements–"claim," "grounds," and "warrant"–are considered the essential components of practical arguments, while the last three—"qualifier," "backing," and "rebuttal"—may not be necessary for all arguments.

Toulmin Exercise

Find an argument in essay form and diagram it using the Toulmin model. The argument can come from an Op-Ed article in a newspaper or a magazine think piece or a scholarly journal. See if you can find all six elements of the Toulmin argument. Use the structure above to diagram your article's argument.

Attributions

10.

TYPES OF CLAIMS

by Jim Marteney

There are three types of claims: **claims of fact, claims of value, and claims of policy**. Each type of claim focuses on a different aspect of a topic. To best participate in an argument, it is beneficial to understand the type of claim that is being argued.

Claim of Fact

A claim of fact asserts that something quantifiable has existed, does exist, or will exist. The center of controversy in a factual claim is over the reasonableness of the fact in question. In other words, a claim of fact debates whether the statement of the claim is correct or incorrect, valid or invalid, true or false. In making such implications, we reason from something that is known to something that is unknown. Claims of fact also focus on cause-to-effect relationships.

The goal in arguing for a claim of fact is to gain audience acceptance that something that is currently not accepted as fact or that something that is currently considered a fact should no longer be considered as such. The goal in arguing against a claim of fact is to get your audience to deny acceptance of some proposed new fact or to defend the status quo that something that is a fact should remain so. Claims of fact may be assertions about the past, present, or future.

Past claims of fact tend to deal with the assigning of motive or responsibility for historical actions. Examples are "General Custer was responsible for the massacre at the Battle of the Little Big Horn," or "Democrat policies caused the rise of terrorism."

Present claims of fact tend to deal with events of current importance. Examples are "There is a God," "Divorce is causing increased juvenile crime," "Video games lead to the increase of violence among teens," or "Climate change is exacerbated by people."

Future claims of fact deal with making predictions about the nature of future events; such as "Tuition at community colleges will be increased next year," "Oil prices will continue to rise" or "The Tesla Model 3 will become the best-selling sedan in the United States."

Claims of fact are quantifiable. That is, establishing the correctness of factual claims depends heavily on empirical verification. Such verification, or evidence, usually consists of using some combination of sensory data (sight, smell, touch, sound, and taste).

Claim of Value

A claim of value asserts qualitative judgments along a good-to-bad continuum relating to persons, events, and things in one's environment. If you construct a position claiming that something is good or bad or one thing is better than another, you've made a claim of value. Examples of claims of value are *"*The Wizard of Oz is the greatest movie of all time*,"* *"*Snowboarding is the greatest way to spend a vacation*,"* or *"*Indian food is the best food of all.*"*

The center of argument in a value claim is over the criteria used in making the judgment. Value claims call into question a standard of comparison: bad as compared to what, good as compared to what, superior as compared to what? All judgments we make are opinions that compare two or more items and assert that one of the items is, by comparison, the better one. For instance, *"*Coke is better than Pepsi*,"* *"*Natural gas is our best energy source*,"* and *"*George Washington is the greatest President of all time.*"* How do you define words like *"*better*,"* *"*best*,"* and *"*greatest*"?* And more importantly, do you and the person you are arguing with define them identically? If not, that difference must be resolved first with agreed-upon definitions of these key terms. Then you can begin your argument.

In our everyday decisions, we make many kinds of value judgments. Our own experiences reveal how difficult it often is to empirically quantify these judgments. Your parents ask you not to associate with a certain person because they are a *"*bad influence.*"* You go to a certain college to get a "good" education. You buy a certain car because it is *"*better*"* than other similar cars. What is a "bad" influence, a "good" education, a "better" car? These words have no universality or common understanding. This puts you in the position of having to define how value judgments are made in a particular situation, to argue for that definition, and to assess how well the person/thing being judged meets that definition.

For example, with the claim "Abraham Lincoln is the greatest president ever," the advocate would have to prove either or both that Lincoln meets the criteria for a great president, which involves arguing for the criteria as well as judging his play against that criteria AND that he meets the criteria better than any other president, which involves comparing and contrasting his presidency to other presidents.

A person's values are often called into play when a person is arguing morality. Since value claims cannot be empirically supported, our arguments with others tend to be qualitative and without much factual support. One significant problem in social argumentation is that we tend to view claims of value as claims of fact, and thus we shift the focus of argument from good and bad to true or false. Value claims are the hardest on which to reach consensus because of the lack of objective criteria.

A major problem we often face is that we frequently argue claims of value as if they are claims of fact. Look at the following claims:

- Law and Order is the best program on television.
- Barack Obama was a great president.

- Abortion is morally wrong.
- The Lakers are better than the Celtics.

All of these claims are claims of value. We tend, however, to often debate them as if they were claims of fact, or "true or false" statements. Instead of getting others to accept our position as having the same validity as theirs does, successful conflict resolution demands that one of us abandon our "false" position and accept the other's "true" position.

We do this without the universal criteria necessary for such "truthfulness" to be argued. We expect that others will accept our value judgments as "true," without the empirical data necessary to prove such judgments. This is why social argumentation occasionally breaks down into quarreling and bickering, and why we have such a difficult time getting along with others who see the world differently than we do. Because most values are personal, and because the process of argumentation calls for one side or the other to abandon a value, constructive conflict resolution is hard to achieve when debating value claims.

Claim of Policy

A claim of policy asserts that something should or should not be done by someone about something. It proposes that some specific course of action should, but not necessarily will, be taken. The key word in a claim of policy is the conditional verb "should" which implies that some action ought to be taken, but not that it must or will be taken. For instance, "The United States should send a manned expedition to Mars," or "Students should read the assigned text material before the instructor lectures on it." Policy claims are analyzed by locating the sub-claims of fact (the need for a policy change in the status quo) or value claims (the desirability of making such a change) inherent in the policy claim.

For example, the following claim has been advanced, "All professional athletes should be randomly drug-tested." We can analyze this claim by first finding the sub-claims of fact, which center around the need for drug testing of athletes. We might discover the following: drug use among athletes has increased, drug use affects athletic performance, athletes are role models for youth, and other methods to discourage drug use have not worked. In order to discover the sub-claims of value, we need to discuss the desirability of drug testing on athletes. We might discover the following: athletic performance will be greatly improved if we have mandatory drug testing, fans will have greater respect for athletes if they submit to drug tests, or random drug testing is the best way to deal with drug use in sports. We can now debate the original claim using these sub-claims as the major arguments that will determine pro or con adherence.

With a claim of policy, the pro-side in a debate must establish a need in the system for a change and desirability of their approach. The con-side only needs to defeat one of the two to defeat the claim.

Remember,

- Claims of fact are quantifiable statements that focus on the accuracy, correctness, or validity of such statements and can be verified using some objective evidence.
- Claims of value are qualitative statements that focus on judgments made about the

environment and invite comparisons.

- Claims of policy are statements that focus on actions that should be taken to change the status quo.

Attributions

PART IV

INFORMATION LITERACY

11.

A BEGINNER'S GUIDE TO INFORMATION LITERACY

by Emily Metcalf

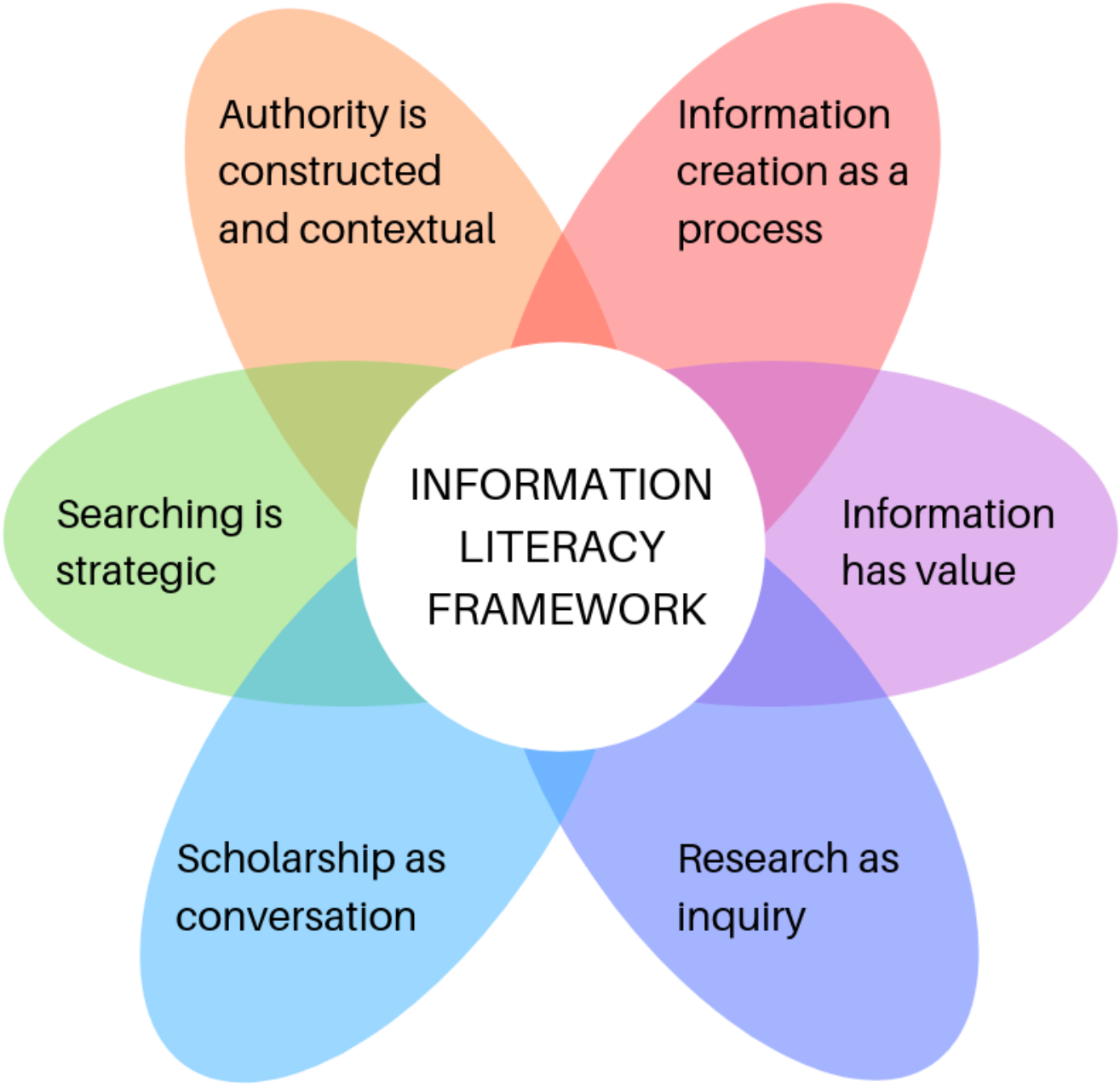

Figure 11.1

Introduction

Welcome to "A Beginner's Guide to Information Literacy," a step-by-step guide to understanding information literacy concepts and practices.

This guide will cover each frame of the "Framework for Information Literacy for Higher Education," a document created by the Association of College and Research Libraries (ACRL) to help educators and librarians think about, teach, and practice information literacy (see Figure 11.1). The goal of this guide is to break down the basic concepts in the Framework and put them in accessible, digestible language so that we can think critically about the information we're exposed to in our daily lives.

To start, let's look at the ACRL definition of "information literacy," so we have some context going forward:

> Information Literacy is the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning.

Boil that down and what you have are the essentials of information literacy: asking questions, finding information, evaluating information, creating information, and doing all of that responsibly and ethically.

We'll be looking at each of the frames alphabetically, since that's how they are presented in the framework. None of these frames is more important than another, and all need to be used in conjunction with the others, but we have to start somewhere, so alphabetical it is!

In order, the frames are

1. Authority is constructed and contextual
2. Information creation as a process
3. Information has value
4. Research as inquiry
5. Scholarship as conversation
6. Searching as strategic exploration

Just because we're laying this out alphabetically does not mean you have to go through it in order. Some of the sections reference frames previously mentioned, but for the most part you can jump to wherever you like and use this guide however you see fit. You can also open up the framework using the link above or in the attached resources to read the framework in its original form and follow along with each section.

The following sections originally appeared as blog posts for the Texas A&M Corpus Christi's library blog. Edits have been made to remove institutional context, but you can see the original posts in the Mary and Jeff Bell Library blog archives.

Authority is Constructed and Contextual

The first frame is "Authority is Constructed and Contextual." There's a lot to unpack in that language, so let's get started.

Start with the word "authority."

At the root of "authority" is the word "author." So start there: who wrote the piece of information you're reading? Why are they writing? What stake do they have in the information they're presenting? What are their credentials (You can straight up google their name to learn more about them)? Who are they affiliated with? A public organization? A university? A company trying to make a profit? Check it out.

Now let's talk about how authority is "constructed."

Have you ever heard the phrase "social construct"? Some people say gender is a social construct or language, written and spoken, is a construct. "Constructed" basically means humans made it up at some point to instill order in their communities. It's not an observable, scientifically inevitable fact. When we say "authority" is constructed, we're basically saying that we as individuals and as a society choose who we give authority to, and sometimes we might not be choosing based on facts.

A common way of assessing authority is by looking at an author's education. We're inclined to trust someone with a PhD over someone with a high school diploma because we think the person with a PhD is smarter. That's a construct. We're conditioned to think that someone with more education is smarter than people with less education, but we don't know it for a fact.

There are a lot of reasons someone might not seek out higher education. They might have to work full time or take care of a family or maybe they just never wanted to go to college. None of these factors impact someone's intelligence or ability to think critically.

If aliens land on South Padre Island, TX, there will be many voices contributing to the information collected about the event. Someone with a PhD in astrophysics might write an article about the mechanical workings of the aliens' spaceship. Cool; they are an authority on that kind of stuff, so I trust them.

But the teenager who was on the island and watched the aliens land has first-hand experience of the event, so I trust them too. They have authority on the event even though they don't have a PhD in astrophysics.

So, we cannot think someone with more education is inherently more trustworthy or smarter or has more authority than anyone else. Some people who are authorities on a subject are highly educated, some are not.

Likewise, let's say I film the aliens landing and stream it live on Facebook. At the same time, a police officer gives an interview on the news that says something contradicting my video evidence. All of a sudden, I have more authority than the police officer. Many of us are raised to trust certain people automatically based on their jobs, but that's also a construct. The great thing about critical thinking is that we can identify what is fact and fiction, and we can decide for ourselves who to trust.

The final word is "contextual."

This one is a little simpler. If I go to the hospital and a medical doctor takes out my appendix, I'll probably be pretty happy with the outcome. If I go to the hospital and Dr. Jill Biden, a professor of English, takes out my appendix, I'm probably going to be less happy with the results.

Medical doctors have authority in the context of medicine. Dr. Jill Biden has authority in the context of education. And Doctor Who has authority in the context of inter-galactic heroics and nice scarves.

This applies when we talk about experiential authority, too. If an eighth-grade teacher tells me what it's like to be a fourth-grade teacher, I will not trust their authority. I will, however, trust a fourth-grade teacher to tell me about teaching fourth grade.

The Takeaway

Basically, when we think about authority, we need to ask ourselves, "Do I trust them? Why?" If they do not have experience with the subject (like witnessing an event or holding a job in the field) or subject expertise (like education or research), then maybe they aren't an authority after all.

P.S. I'm sorry for the uncalled-for dig, Dr. Biden. I'm sure you'd do your best with an appendectomy.

Ask Yourself

- In what context are you an authority?
- If you needed to figure out how to do a kickflip on a skateboard, who would you ask? Who's an authority in that situation?

Information Creation as a Process

The second frame is "Information Creation as a Process."

Information Creation

So first of all, let's get this out of the way: everyone is a creator of information. When you write an essay, you're creating information. When you log the temperature of the lizard tank, you're creating information. Every Word Doc, Google Doc, survey, spreadsheet, Tweet, and PowerPoint that you've ever had a hand in? All information products. That YOU created. In some way or another, you created that information and put it out into the world.

Processes

One process you're probably familiar with if you're a student is the typical research paper. You know your professor wants about five to eight pages consisting of an introduction that ends in a thesis statement, a few paragraphs that each touch on a piece of evidence that supports your thesis, and then you end in a conclusion paragraph which starts with a rephrasing of your thesis statement. You save it to your hard drive or Google Drive and then you submit it to your professor.

This is one process for creating information. It's a boring one, but it's a process.

Outside of the classroom, the information-creation process looks different, and we have lots of choices to make.

One of the choices you'll need to make is the mode or format in which you present information. The information I'm creating right now comes to you in the mode of an Open Educational Resource. Originally, I created these sections as blog posts. Those five-page essays I mentioned earlier are in the mode of essays.

When you create information (outside of a course assignment), it's up to you how to package that information. It might feel like a simple or obvious choice, but some information is better suited to some forms of communication. And some forms of communication are received in a certain way, regardless of the information in them.

For example, if I tweet "Jon Snow knows nothing," it won't carry with it the authority of my peer-reviewed scholarly article that meticulously outlines every instance in which Jon Snow displays a lack of knowledge. Both pieces of information are accurate, but the processes I went through to create and disseminate the information have an effect on how the information is received by my audience.

And that is perhaps the biggest thing to consider when creating information: your audience.

The Audience Matters

If I just want my twitter followers to know Jon Snow knows nothing, then a tweet is the right way to reach them. If I want my tenured colleagues and other various scholars to know Jon Snow knows nothing, then I'm going to create a piece of information that will reach them, like a peer-reviewed journal article.

Often, we aren't the ones creating information; we're the audience members ourselves. When we're scrolling on Twitter, reading a book, falling asleep during a PowerPoint presentation—we're the audience observing the information being shared. When this is the case, we have to think carefully about the ways information was created.

Advertisements are a good example. Some are designed to reach a 20-year old woman in Corpus Christi through Facebook, while others are designed to reach a 60-year old man in Hoboken, NJ over the radio. They might both be selling the same car, and they're going to put the same information (size, terrain, miles per gallon, etc.) in those ads, but their audiences are different, so their information-creation process is different, and we end up with two different ads for different audiences.

Be a Critical Audience Member

When we are the audience member, we might automatically trust something because it's presented a certain way. I know that, personally, I'm more likely to trust something that is formatted as a scholarly article than I am something that is formatted as a blog. And I know that that's biased thinking and it's a mistake to make that assumption.

It's risky to think like that for a couple of reasons:

- Looks can be deceiving. Just because someone is wearing a suit and tie doesn't mean they're not an axe murderer and just because something looks like a well-researched article, doesn't mean it is one.
- Automatic trust unnecessarily limits the information we expose ourselves to. If I only ever allow myself to read peer-reviewed scholarly articles, think of all the encyclopedias and blogs and news articles I'm missing out on!

If I have a certain topic I'm really excited about, I'm going to try to expose myself to information regardless of the format and I'll decide for myself (#criticalthinking) which pieces of information are authoritative and which pieces of information suit my needs.

Likewise, as I am conducting research and considering how best to share my new knowledge, I'm going to consider my options for distributing this newfound information and decide how best to reach my audience. Maybe it's a tweet, maybe it's a Buzzfeed quiz, or maybe it's a presentation at a conference. But whatever mode I choose will also convey implications about me, my information creation process, and my audience.

The Takeaway

You create information all of the time. The way you package and share it will have an effect on how others perceive it.

Ask Yourself

- Is there a form of information you're likely to trust at first glance? Either a publication like a newspaper or a format like a scholarly article?
- Can you think of some voices that aren't present in that source of information?
- Where might you look to find some other perspectives?
- If you read an article written by medical researchers that says chocolate is good for your health, would you trust the article?
- Would you still trust their authority if you found out that their research was funded by a company that sells chocolate bars? Funding and stakeholders have an impact on the creation process, and it's worth thinking about how this can compromise someone's authority.

Information Has Value

Onwards and upwards! We're onto frame 3: "Information Has Value."

What Counts as Value?

There are a lot of different ways we value things. Some things, like money, are valuable to us because we can exchange them for goods and services. On the other hand, some things, like a skill, are valuable to us because we can exchange them for money (which we exchange for more goods and services). Some things are valuable to us for sentimental reasons, like a photograph or a letter. Some things, like our time, are valuable because they are finite.

The Value of Information

Information has all kinds of value.

One kind is monetary. If I write a book and it gets published, I'm probably going to make some money off of that (though not as much money as the publishing company will make). So that's valuable to me.

But I'm also getting my name out into the world, and that's valuable to me too. It means that when I apply for a job or apply for a grant, someone can google me and think, "Oh look! She wrote a book! That means she has follow-through and will probably work hard for us!" That kind of recognition is a sort of social value. That social value, by the way, can also become monetary value. If I've produced information, a university might give me a job, or an organization might fund my research. If I've invented a machine that will floss my teeth for me, the patent for my invention could be worth a lot of money (plus it'd be awesome. Cool factor can count as value.).

In a more altruistic slant, information is also valuable on a societal level. When we have more information about political candidates, for example, it influences how we vote, who we elect, and how our country is governed. That's some really valuable information right there. That information has an effect on the whole world (plus outer space, if we elect someone who's super into space exploration). If someone is trying to keep information hidden or secret, or if they're spreading misinformation to confuse people, it's probably a sign that the information they're hiding is important, which is to say, valuable.

On a much smaller scale, think about the information on food packages. If you're presented with calorie counts, you might make a different decision about the food you buy. If you're presented with an item's allergens, you might avoid that product and not end up in an Emergency Room with anaphylactic shock. You know what's super valuable to me? NOT being in an Emergency Room!

But if you do end up in the Emergency Room, the information that doctors and nurses will use to treat your allergic reaction is extremely valuable. That value of that information is equal to the lives it's saved.

Acting Like Information is Valuable

When we create our own information by writing papers and blog posts and giving presentations, it's really important that we give credit to the information we've used to create our new information product for a couple of reasons.

First, someone worked really hard to create something, let's say an article. And that article's information is valuable enough to you to use in your own paper or presentation. By citing the author properly, you're giving the author credit for their work, which is valuable to them. The more their article is cited, the more valuable it becomes because they're more likely to get scholarly recognition and jobs and promotions.

Second, by showing where you're getting your information, you're boosting the value of your new information product. On the most basic level, you'll get a higher grade on your paper, which is valuable to you. But you're also telling your audience, whether it's your professor or your boss or your YouTube subscribers, that you aren't just making stuff up—you did the work of researching and citing, and that makes your audience trust you more. It makes the audience value your information more.

Remember early on when I said the frames all connect? "Information Has Value" ties into the other information literacy frames we've talked about, "Information Creation as a Process" and "Authority as Constructed and Contextual." When I see you've cited your sources of information, then I, as the audience, think you're more authoritative than someone who doesn't cite their sources. I also can look at your information product and evaluate the effort you've put into it. If you wrote a tweet, which takes little time and effort, I'll generally value it less than if you wrote a book, which took a lot of time and effort to create. I know that time is valuable, so seeing that you were willing to dedicate your time to create this information product makes me feel like it's more valuable.

The Takeaway

Information is valuable because of what goes into its creation (time and effort) and what comes from it (an informed society). If we didn't value information, we wouldn't be moving forward as a society, we'd probably have died out thousands of years ago as creatures who never figured out how to use tools or start a fire.

So continue to value information because it improves your life, your audiences' lives, and the lives of other information creators. More importantly, if we stop valuing information a smarter species will eventually take over and it'll be a whole Planet of the Apes thing and I just don't have the energy for that right now.

Ask Yourself

- Can you think of some ways in which a YouTube video on dog training has value? Who values it? Who profits from it?
- Think of some information that would be valuable to someone applying to college. What does that person need to know?

Research as Inquiry

Easing on down the road, we've come to frame number 4: "Research as Inquiry."

"Inquiry" is another word for "curiosity" or "questioning." I like to think of this frame as "Research as Curiosity," because I think it more accurately captures the way our adorable human brains work.

Inquiring Minds Want to Know

When you think to yourself, "How old is Madonna?" and you google it to find out she's 62 (as of the creation of this resource), that's research! You had a question ("how old is Madonna?"), you applied a search strategy (googling "Madonna age") and you found an answer (62). That's it! That's all research has to be!

But it's not all research *can* be. This example, like most research, is comprised of the same components we use in more complex situations. Those components are a question and an answer, inquiry and research, "how old is Madonna?" and "62." But when we're curious, we go back to the inquiry step again and ask more questions and seek more answers. We're never really done, even when we've answered the initial question and written the paper and given the presentation and received accolades and awards for all our hard work. If it's something we're really curious about, we'll keep asking and answering and asking again.

If you're really curious about Madonna, you don't just think, "How old is Madonna?" You think "How old is Madonna? Wait, *really*? Her skin looks amazing! What's her skincare routine? Seriously, what year was she born? Oh my god, she wrote children's books! Does my library have any?" Your questions lead you to answers which, when you're really interested in a topic, lead you to more and more questions. Humans are naturally curious; we have this sort of instinct to be like, "huh, I wonder why that is?" and it's propelled us to learn things and try things and fail and try again! It's all research as inquiry.

And to satisfy your curiosity, yes, the library I currently work at does own one of Madonna's children's books. It's called *The Adventures of Abdi,* and you can find it in our Juvenile Collection on the second floor at PZ8 M26 Adv 2004. And you can find a description of her skincare routine in this article from W Magazine: https://www.wmagazine.com/story/madonna-skin-care-routine-tips-mdna. You're welcome.

Identifying an Information Need

One of the tricky parts of research as inquiry is determining a situation's information need. It sounds simple to ask yourself, "What information do I need?" and sometimes we do it unconsciously. But it's not always easy. Here are a few examples of information needs:

- You need to know what your niece's favorite *Paw Patrol* character is so you can buy her a birthday present. Your research is texting your sister. She says, "Everest." And now you're done. You buy the present, you're a rock star at the birthday party. Your information need was a short answer based on a three-year old's opinion.
- You're trying to convince someone on Twitter that Nazis are bad. You compile a list of opinion pieces from credible news publications like the *Wall Street Journal* and the *New York Times*, gather first-hand narratives of Holocaust survivors and victims of hate crimes, find articles that debunk eugenics, etc. Your information need isn't scholarly publications, it's accessible news and testimonials. It's articles a person might actually read in their free time, articles that aren't too long and don't require access to scholarly materials that are

sometimes behind paywalls.

- You need to write a literature review for an assignment, but you don't know what a literature review is. So first you google "literature review example." You find out what it is, how one is created, and maybe skim a few examples. Next, you move to your library's website and search tool and try "oceanography literature review," and find some closer examples. Finally, you start conducting research for your own literature review. Your information need here is both broader and deeper. You need to learn what a literature review is, how one is compiled, and how one searches for relevant scholarly articles in the resources available to you.

Sometimes it helps to break down big information needs into smaller ones. Take the last example, for instance: you need to write a literature review. What are the smaller parts?

- Information Need 1: Find out what a literature review is
- Information Need 2: Find out how people go about writing literature reviews
- Information Need 3: Find relevant articles on your topic for your own literature review

It feels better to break it into smaller bits and accomplish those one at a time. And it highlights an important part of this frame that's surprisingly difficult to learn: ask questions. You can't write a literature review if you don't know what it is, so ask. You can't write a literature review if you don't know how to find articles, so ask. The quickest way to learn is to ask questions. Once you stop caring if you look stupid, and once you realized no one thinks poorly of people who ask questions, life gets a lot easier.

So, let's add this to our components of research: ask a question, determine what you need in order to thoroughly answer the question, and seek out your answers. Not too painful, and when you're in love with whatever you're researching, it might even be fun.

The Takeaway

- When you have a question, ask it.
- When you're genuinely interested in something, keep asking questions and finding answers.
- When you have a task at hand, take a second to think realistically about the information you'll need to accomplish that task. You don't need a peer-reviewed article to find out if praying mantises eat their mates, but you might if you want to find out why.

Ask Yourself

- What's the last thing you looked up on Wikipedia? Did you stop when you found an answer, or did you click on another link and another link until you learned about something completely different?
- If you can't remember, try it now! Search for something (like a favorite book or tv show) and click on linked words and phrases within Wikipedia until you learn something new!
- What was the last thing you researched that you were really excited about? Do you struggle

when teachers and professors tell you to "research something that interests you"? Instead, try asking yourself, "What makes me really angry?" You might find you have more interests than you realized!

Scholarship as Conversation

We've made it friends! My favorite frame: "Scholarship as Conversation." Is it weird to have a favorite frame of information literacy? Probably. Am I going to talk about it anyway? You betcha!

What does "Scholarship as Conversation" mean?

Scholarship as conversation refers to the way scholars reference each other and build off of one another's work, just like in a conversation. Have you ever had a conversation that started when you asked someone what they did last weekend and ended with you telling a story about how someone (definitely not you) ruined the cake at your mom's dog's birthday party? And then someone says, "but like I was saying earlier…" and they take the conversation back to a point in the conversation where they were reminded of a different point or story? Conversations aren't linear, they aren't a clear line to a clear destination, and neither is research. When we respond to the ideas and thoughts of scholars, we're responding to the scholars themselves and engaging them in conversation.

Why do I Love this Frame so Much?

Let me count the ways.

Reason 1

I really enjoy the imagery of scholarship as a conversation among peers. Just a bunch of well-informed curious people coming together to talk about something they all love and find interesting. I imagine people literally sitting around a big round table talking about things they're all excited about and want to share with each other. It's a really lovely image in my head. Eventually the image kind of reshapes and devolves into that painting of dogs playing poker, but I love that image too!

Reason 2

It harkens back to pre-internet scholarship, which sounds excruciating and exhausting, but it was all done for the love of a subject. Scholars used to literally mail each other manuscripts seeking feedback. Then, when they got an article published in a journal, scholars interested in the subject would seek out and read the article in the physical journal it was published in. Then they'd write reviews of the article, praising or criticizing the author's research or theories or style. As the field grew, more and more people would write and contribute more articles to criticize and praise and build off of one another.

So, for example, if I wrote an article that was about Big Foot and then Joe wrote an article saying, "Emily's article on Big Foot is garbage; here's what I think about Big Foot," Sam and I are now having a conversation. It's not always a fun one, but we're writing in response to one another about something

we're both passionate about. Later, Jaiden comes along and disagrees with Joe and agrees with me (because I'm right) and they cite both me and Joe. Now we're all three in a conversation. And it just grows and grows and more people show up at the table to talk and contribute, or maybe just to listen.

Reason Three

You can roll up to the table and just listen if you want to. Sometimes we're just listening to the conversation. We're at the table, but we're not there to talk. We're just hoping to get some questions answered and learn from some people. When we're reading books and articles or listening to podcasts or watching movies, we're listening to the conversation. You don't have to do groundbreaking research to be part of a conversation. You can just be there and appreciate what everyone's talking about. You're still there in the conversation.

Reason Four

You can contribute to the conversation at any time. The imagery of a conversation is nice because it's approachable: just pull up a chair and start talking. With any new subject, you should probably listen a little at first, ask some questions, and then start giving your own opinion or theories, but you can contribute at any time. Since we do live in the age of internet research, we can contribute in ways people 50 years ago never dreamed of. Besides writing essays in class (which totally counts because you're examining the conversation and pulling in the bits you like and citing them to give credit to other scholars), you can talk to your professors and friends about a topic, you can blog about it, you can write articles about it, you can even tweet about it (have you ever seen Humanities folk on Twitter? They go nuts on there having actual, literal scholarly conversations). Your ways for engaging are kind of endless!

Reason Five

Yep, I'm listing reasons.

Conversations are cyclical. Like I said above, they're not always a straight path and that's true of research too. You don't have to engage with who spoke most recently; you can engage with someone who spoke ten years ago, someone who spoke 100 years ago, you can even respond to the person who started the conversation! Jump in wherever you want. And wherever you do jump in, you might just change the course of the conversation. Because sometimes we think we have an answer, but then something new is discovered or a person who hadn't been at the table or who had been overlooked says something that drastically impacts what we knew, so now we have to reexamine it all over again and continue the conversation in a trajectory we hadn't realized was available before.

Reason Six

Lastly, this frame is about sharing and responding and valuing one another's work. If Joe, my Big Foot nemesis, responds to my article, they're going to cite me. If Jaiden then publishes a rebuttal, they're going to cite both Joe and me, because fair is fair. This is for a few reasons: 1) even if Jaiden disagrees with Joe's work, they respect that Joe put effort into it and it's valuable to them. 2) When Jaiden cites Joe, it means anyone who jumps into the conversation at the point of Jaiden's article will be able

to backtrack and catch up using Jaiden's citations. A newcomer can trace it back to Joe's article and trace that back to mine. They can basically see a transcript of the whole conversation so they can read Jaiden's article with all of the context, and they can write their own well-informed piece on Big Foot.

The Takeaway

There's a lot to take away from this frame, but here's what I think is most important:

- Be respectful of other scholars' work and their part in the conversation by citing them.
- Start talking whenever you feel ready, in whatever platform you feel comfortable.
- Make sure everyone who wants to be at the table is at the table. This means making sure information is available to those who want to listen and making sure we lift up the voices that are at risk of being drowned out.

Ask Yourself

- What scholarly conversations have you participated in recently? Is there a Reddit forum you look in on periodically to learn what's new in the world of cats wearing hats? Or a Facebook group on roller skating? Do you contribute or just listen?
- Think of a scholarly conversation surrounding a topic—sharks, ballet, *Game of Thrones*. Who's not at the table? Whose voice is missing from the conversation? Why do you think that is?

Searching as Strategic Exploration

You've made it! We've reached the last frame: Searching as Strategic Exploration.

"Searching as Strategic Exploration" addresses the part of information literacy that we think of as "Research." It deals with the actual task of searching for information, and the word "Exploration" is a really good word choice, because it's evocative of the kind of struggle we sometimes feel when we approach research. I imagine people exploring a jungle, facing obstacles and navigating an uncertain path towards an ultimate goal (Note: the goal is love and it was inside of us all along). I also kind of imagine all the different Northwest Passage explorations, which were cool in theory, but didn't super-duper work out as expected.

But research is like that! Sometimes we don't get where we thought we were headed. But the good news is this: You probably won't die from exposure or resort to cannibalism in your research. Fun, right?

Step 1: Identify a Goal

The first part of any good exploration is identifying a goal. Maybe it's a direct passage to Asia or the diamond the old lady threw into the ocean at the end of Titanic. More likely, the goal is to satisfy an information need. Remember when we talked about "Research as Inquiry?" All that stuff about paw patrol and Madonna's skin care regimen? Those were examples of information needs. We're just trying to find an answer or learn something new.

So great! Our goal is to learn something new. Now we make a strategy.

Step 2: Make a Strategy

For many of your information needs you might just need to Google a question. There's your strategy: throw your question into Google and comb through the results. You might limit your search to just websites ending in .org, .gov, or .edu. You might also take it a step further and, rather than type in an entire question fully formed, you just type in keywords. So "Who is the guy who invented mayonnaise?" becomes "mayonnaise inventor." Identifying keywords is part of your strategy and so is using a search engine and limiting the results you're interested in.

Step 3: Start Exploring

Googling "mayonnaise inventor" probably brings you to Wikipedia where we often learn that our goals don't have a single, clearly defined answer. For example, we learn that mayonnaise might have gotten its name after the French won a battle in Port Mahon, but that doesn't tell us who actually *made* the mayonnaise, just *when* it was named. Prior to being named, the sauce was called "aioli bo" and was apparently in a Menorcan recipe book from 1745 by Juan de Altimiras. That's great for Altimiras, but the most likely answer is that mayonnaise was invented way before him and he just had the foresight to write down the recipe. Not having a single definite answer is an unforeseen obstacle tossed into our path that now affects our strategy. We know we have a trickier question than when we first set sail.

But we have a lot to work with! We now have more keywords like "Port Mahon," "the French," and *Wikipedia* taught us that the earliest known mention of "mayonnaise" was in 1804, so we have "1804" as a keyword too.

Let's see if we can find that original mention. Let's take our keywords out of Wikipedia where we found them and voyage to a library's website! At my library we have a tool that searches through all of our resources. We call it the "Quick Search." You might have a library available to you, either at school, on a university's campus, or a local public library. You can do research in any of these places!

So into the Quick Search tool (or whatever you have available to you) go our keywords: "1804," "mayonnaise," and "France." The first result I see is an e-book by a guy who traveled to Paris in 1804, so that might be what we're looking for. I search through the text and I do, in fact, find a reference to mayonnaise on page 99! The author (August von Kotzebue) is talking about how it's hard to understand menus at French restaurants, for "What foreigner, for instance, would at first know what is meant by a mayonnaise de poulet, a galatine de volaille, a cotelette a la minute, or even an epigramme d'agneau?" He then goes on to recommend just ordering the fish, since you'll know what you'll get (Kotzebue 99).

So that doesn't tell us who invented mayonnaise, but I think it's pretty funny! So I'd call that detour a win.

Step 4: Reevaluate

When we hit ends that we don't think are successful, we can always retrace our steps and reevaluate our question. Dead ends are a part of exploration! We've learned a lot, but we've also learned that maybe "who invented mayonnaise?" isn't the right question. Maybe we should ask questions about the evolution of French cuisine or about ownership of culinary experimentation.

I'm going to stick with the history of mayonnaise, for just a little while longer, but my "1804 mayonnaise France" search wasn't as helpful as I'd hoped, so I'll try something new. Let's try looking at encyclopedias.

I searched in a database called Credo Reference (which is a database filled with encyclopedia entries) and just searching "mayonnaise." I can see that the first entry, "Minorca or Menorca" from *The Companion to British History*, doesn't initially look helpful, but we're exploring, so let's click on it. It tells us that mayonnaise was invented in 1756 by a French commander's cook and its name comes from Port Mahon where the French fended off the British during a siege (Arnold-Baker, 2001). That's awesome! It's what *Wikipedia* told us! But let's corroborate that fact. I click on *The Hutchinson Chronology of World History* entry for 1756, which says mayonnaise was invented in France in 1756 by the duc de Richelieu (Helicon, 2018). I'm not sure I buy it. I could see a duke's cook inventing mayonnaise, but I have a hard time imagining a duke and military commander taking the time to create a condiment.

But now I can go on to research the duc de Richelieu and his military campaigns and his culinary successes. Just typing "Duke de Richelieu" into the library's Quick Search shows me a TON of books (16,742 as of writing this) on his life and he influence on France. So maybe now we're actually exploring Richelieu or the intertwined history of French cuisine and the lives of nobility.

What Did We Just Do?

Our strategy for exploring this topic has had a lot of steps, but they weren't random. It was a wild ride, but it was a strategic one. Let's break the steps down real quick:

1. We asked a question or identified a goal
2. We identified keywords and googled them
3. We learned some background information and got new keywords from *Wikipedia* and had to reevaluate our question
4. We followed a lead to a book but hit a dead end when it wasn't as useful as we'd hoped
5. We identified an encyclopedia database and found several entries that support the theory we learned in Wikipedia, which forced us to reevaluate our question again
6. We identified a key player in our topic and searched for him in the library's Quick Search tool and the resources we found made us reevaluate our question yet again

Other strategies could include looking through an article's reference list, working through a mind map, outlining your questions, or recording your steps in a research log so you don't get lost—whatever works for you!

The Takeaway

Exploration is tricky. Sometimes you circle back and ask different questions as new obstacles arise. Sometimes you have a clear path and you reach your goal instantly. But you can always retrace your steps, try new routes, discover new information, and maybe you'll get to your destination in the end. Even if you don't, you've learned something.

For instance, today we learned that if you can't understand a menu in French, you should just order the fish.

Ask Yourself

- Where do you start a search for information? Do you start in different places when you have different information needs?
- If your research question was "What is the impact of fast fashion on carbon emissions?" What keywords would you use to start searching?

Wrap Up

The Framework for Information Literacy in Higher Education is one heck of a document. It's complicated, its frames intertwine, it's written in a way that can be tricky to understand. But essentially, it's just trying to get us to understand that the ways we interact with information are complicated and we need to think about our interactions to make sure we're behaving in an ethical and responsible way.

Why do your professors make you cite things? Because those citations are valuable to the original author, and they prove your engagement with the scholarly conversation. Why do we need to hold space in the conversation for voices that we haven't heard from before? Because maybe no one recognized the authority in those voices before. The old process for creating information shut out lots of voices while prioritizing others. It's important for us to recognize these nuances when we see what information is available to us and important for us to ask, "Whose voice isn't here? Why? Am I looking hard enough for those voices? Can I help amplify them?" And it's important for us to ask, "Why is the loudest voice being so loud? What motivates them? Why should I trust them over others?"

When we think critically about the information we access and the information we create and share, we're engaging as citizens in one big global conversation. Making sure voices are heard, including your own voice, is what moves us all towards a more intelligent and understanding society.

Of course, part of thinking critically about information means thinking critically about both this guide and the framework. Lots of people have criticized the framework for including too much library jargon. Other folks think the framework needs to be rewritten to explicitly address how information seeking systems and publishing platforms have arisen from racist, sexist institutions. We won't get into the

criticisms here, but they're important to think about. You can learn more about the criticism of the framework in a blog post by Ian Beilin, or you can do your own search for criticism on the framework to see what else is out there and form your own opinions.

The Final Takeaway

Ask questions, find information, and ask questions about that information.

Attributions

PART V

RESEARCH WRITING IN ACADEMIC DISCIPLINES

12.

METHODS OF DISCOVERY

by Pavel Zemliansky

Regardless of the academic discipline in which you conduct research and write, at the heart of the research and writing processes lie the same principles. These principles are critical reading and writing, active and creative interpretation of research sources and data, and writing rhetorically. At the same time, as a college writer, you probably know that research and writing assignments differ from one academic discipline to another. For example, different academic disciplines require researchers to use different research methods and techniques. Writers in different disciplines are also often required to discuss the results of their research differently. Finally, as you probably know, the finished texts look different in different disciplines. They often use different format and organizational structure and use different citation and documentation systems to acknowledge research sources.

All these differences are rhetorical in nature. Researchers and writers in different academic disciplines do what they do because they have a certain rhetorical purpose to fulfill and a certain audience to reach. In order to make their research understood and to enable others in their intellectual community to follow their ideas and theories, academic writers conform to the expectations of their readers. They follow the research methods and procedures as well as the conventions of presenting that research established by their academic community.

As a college student, you have probably noticed that your professors in different classes will give you different assignments and expect different things from you as a researcher and a writer. Researching this chapter, I looked for the types of writing and research assignments that professors of different academic disciplines assign to students at the university where I work by browsing websites of its different departments. As I expected, there was a considerable variety of purposes, audience, and research methods. I saw assignments ranging from annual accounting reports assigned in a business class, to studies of various countries' political systems in a political science course, to a web search for information on cystic fibrosis in a cell biology class. All these assignments had different parameters and expected writers to do different things because they reflected the peculiarities of research and writing in the disciplines in which they were assigned.

This variety of assignments, methods, and approaches is universal. A study by Daniel Melzer examined the kinds of research and writing assignments students in various colleges and universities across the nation receive in different disciplines. Melzer shows that students in various academic disciplines are asked to conduct research for a variety of purposes, which ranged from informing and persuading to exploration and self-expression (91). Also, according to Melzer's study, students in different disciplines researched and wrote for a variety of audiences, which included not only the instructor of their class but also their classmates and wider audiences outside of their classes (95).

Despite this variety of goals, methods, and approaches, there are several key principles of source-based writing that span different academic disciplines and professions. These principles are outlined in the following sentences:

- The purpose of academic writing is to generate and communicate new knowledge and new ideas.
- Academic writers write "from sources." This means that new ideas, conclusions, and theories are created on the basis of existing ideas and existing research.
- Academic writers examine their sources carefully for their credibility and appropriateness for the writer's goals and objectives.
- Academic writers carefully acknowledge all their research sources using source citation and documentation systems accepted in their disciplines.

So, one chapter or even a whole book cannot cover all the nuances and conventions of research and writing in every academic discipline. My purpose in this chapter is different. I would like to explore, together with you, the fundamental rhetorical and other principles and approaches that govern research writing across all academic disciplines. This chapter also offers activities and projects which, I hope, will make you more aware of the peculiar aspects of researching and writing in different academic disciplines. My goal in this chapter is to enable my readers to become active and critical investigators of the disciplinary differences in research and writing. Such an active approach will enable you to find out what I cannot cover here by reading outside of this book, by talking to your professors, and by practicing research and writing across disciplines.

Intellectual and Discourse Communities

My contention throughout my research has been that, in order to become better researchers and writers, we need to know not only the "how's" of these two activities but also the "why's." In other words, it is not sufficient to acquire practical skills of research and writing. It is also necessary to understand why you do what you do as you research and what results you can expect to achieve as a result of your research. And this is where rhetorical theory comes in.

Writing and reading are interactive, social processes. Ideas presented in written texts are born as a result of long and intense dialog between authors and others interested in the same topic or issue. Gone is the image of the medieval scholar and thinker sitting alone in his turret, surrounded by his books and scientific instruments as the primary maker and advancer of knowledge. Instead,

the knowledge-making process in modern society is a collaborative effort to which many parties contribute. Knowledge is not a product of individual thinking, but of collective work, and many people contribute to its creation.

Academic and professional readers and writers function within groups known as discourse communities. The word "discourse" means the language that a group uses to talk about what interests its members. For example, as a student, you belong to the community of your academic discipline. Together with other members of your academic discipline's intellectual community, you read the same literature, discuss and write about the same subjects, and are interested in solving the same problems. The language or discourse used by you and your fellow intellectuals in professional conversations (both oral and written) is discipline-specific. This explains, among other things, why the texts you read and write in different academic disciplines are often radically different from one another and even why they are often evaluated differently.

To examine your place in discourse communities, complete "Writing Activity 6A: Analyzing Intellectual and Discourse Communities" in the "Writing Activities" section of this chapter.

The term "community" does not necessarily mean that all members of these intellectual and discourse groups agree on everything. Nor does it mean that they must be geographically close to one another to form such a community. Quite the opposite is often true. Debates and discussions among scientists and other academics who see things differently allow knowledge to advance. These debates in discussions are taking place in professional books, journals, and other publications, as well as at professional meetings.
Rhetorical analysis is a key skill in critically examining sources. Complete "Writing Activity 6B: Rhetorical Analysis of Academic Texts" in the "Writing Activities" section of this chapter.

The Making of Knowledge in Academic Disciplines

In the preceding section of this chapter, I made a claim that the making of new knowledge is a social process, undertaken by intellectual communities. In this section, we will look at one influential theory that has tried to explain how exactly this knowledge-making process happens. The theory of knowledge-making that I am talking about was proposed by Thomas Kuhn in his much-cited 1962 book *The Structure of Scientific Revolutions*. Although, as the book's title suggests, Kuhn was writing about sciences, Kuhn's theory has now been accepted as relevant and useful not only by academic disciplines outside of natural sciences.

According to Kuhn, the change in human knowledge about any subject takes place in the following steps. At first, an academic discipline or any other intellectual community works within the confines of an accepted theory or theories. The members of the community use it systematically and methodically.
Kuhn calls this theory or theories the accepted paradigm, or standard of the discipline. Once the majority of an intellectual community accepts a new paradigm, the community's members work on expanding this paradigm but not on changing it. While working within an established paradigm, all members of an intellectual community have the same assumptions about what they study and discuss, use the same research methods and approaches, and use the same methods to present and compare the results of their investigation. Such uniformity allows them to share their work with one another easily.

More importantly, though, staying within an accepted paradigm allows researchers to create a certain version of reality that is based on the paradigm that is being used and that is accepted by all members of the community. For example, if a group of scientists studies something using a common theory and common research methods, the results that such investigation yields are accepted by this group as a kind of truth or fact that had been experimentally verified.

Changes in scientific paradigms happen, according to Kuhn, when scientists begin to observe unusual phenomena or unexpected results in their research. Kuhn calls such phenomena "anomalies." When anomalies happen, the current paradigm or system of research and thinking that a community employs fails to explain them. Eventually, these anomalies become so great that they are impossible to ignore. Then, a shift in paradigm becomes necessary. Gradually, then, existing paradigms are re-examined and revised, and new ones are established. When this happens, old knowledge gets discarded and substituted by new knowledge. In other words, an older version of reality is replaced by a newer version. To illustrate his theory, Kuhn uses the paradigm shift started by the astronomer Copernicus and his theory that the earth revolves around the sun. I have also used this example in the chapter of my book dedicated to rhetoric to show that even scientific truths that seem constant and unshakable are subject to revision and change. To an untrained eye, it may seem that all scientists and other researchers do is explain and describe reality that is unchangeable and stable. However, when an intellectual community is working within the confines of the current paradigm, such as a scientific theory or a set of research methods, their interpretations of this reality are limited by the capabilities and limitations of that paradigm. In other words, the results of their research are only as good as the system they use to obtain those results. Once the paradigm use for researching and discussing the subjects of investigation changes, the results of that investigation may change, too. This, in turn, will result in a different interpretation of reality.

Application of the Concept of Discourse Communities to Research Writing

Kuhn's theory of knowledge making is useful for us as researchers and writers because it highlights the instability and changeability of the terms "fact" and "opinion." The popular perception of these two terms is that they are complete opposites. According to this view, facts can be verified by empirical or experimental methods, while opinions are usually purely personal and cannot be verified or proven since they vary from one person to another. Facts are also objective while opinions are subjective. This ways of thinking about facts and opinions is especially popular among beginning writers and researchers. When I discuss with my students their assumptions about research writing, I often hear that research papers are supposed to be completely objective because they are based on fact and that creative writing is subjective because it is based on opinion. Moreover, such writers say it is impossible to argue with facts, but it is almost equally impossible to argue with opinions since every person is entitled to one and since we can't really tell anyone that their opinions are wrong.

In college writing, such a theory of fact and opinion has very tangible consequences. It often results in writing in which the author is either too afraid to commit to a theory or points of view because they are afraid of being labeled subjective or biased. Consequently, such writers create little more than summaries of available sources. Other inexperienced writers may take the opposite route, writing exclusively or almost exclusively from their current understanding of their topics or from their current

opinions. Since "everyone is entitled to their own opinion," they reason, no one can question what they have written even if that writing is completely unpersuasive. In either case, such writing fails to fulfill the main purpose of research, which is to learn.

What later becomes an accepted theory in an academic discipline begins as someone's opinion. Enough people have to be persuaded by a theory in order for it to approach the status of accepted knowledge. All theories are subject to revision and change, and who is to say some time down the road, a better research paradigm will not be invented that would overturn what we now consider a solid fact. Thus, research and the making of knowledge are not only social processes but also rhetorical ones. Change in human understanding of difficult problems and issues takes place over time. By researching those problems and issues and by discussing what they find with others, writers advance their community's understanding and knowledge.

Investigating Histories of Academic Discussions

The subjects of academic research, debates, and disagreements develop over time. To you as a student, it may seem that when you read textbooks and other professional literature in your major or other classes you are taking, you are taking in permanent and stable truths. Yet, members of academic communities decide what topics and questions are important and worth researching and discussing before these discussions make it to the textbook of the pages of an academic journal.

As a student, you will be invited to examine the history and development of an issue, problem, or question in your major or other academic disciplines that interests you. In other words, you will be a historian of an academic discipline whose job will be to trace the development of a topic, question, or issue important to one academic community.

How far you will take this project will depend on the time you have, the structure of your class, and the advice of your instructor. For example, you may be limited to conducting a simple series of searches and preparing an oral presentation for your classmates. Or you may decide to make a full-length writing project out of this assignment, at the end creating a research essay, an I-search paper, or some other written document presenting and discussing the results of your research.

In either case, try to follow the following steps during this project. Depending on the instructions from your teacher, you may work by yourself or with others.

In order to select an important issue or question that is actively discussed in your academic or professional community, first look through the textbooks in your major or any other academic discipline you are interested in.

Next, conduct a library search for journals in the field and briefly look over what topics, issues, or questions they are concerned with. Conduct a web search for reliable sites where these professional discussions are taking place. If you are taking a class or classes in the discipline you are studying, discuss this assignment and the emerging topic of your investigation with your professor. Try to find out how this topic is explained to the general public in popular magazines and newspapers.

Remember that your goal at this stage of the process not to learn and report on the current state of this discussion (although such reporting may be a part of your project), but to investigate its historical development as an issue or a problem in the academic discipline of your interest.

Develop a general understanding of the current state of the issue or topic you are interested in. Be sure to include the following elements:

- What is the topic of discussion?
- What evidence of the topic's importance for your academic discipline have you found?
- What is being said about the issue and by whom?
- Are there opposing sides in the discussion and on what ground do they oppose each other?
- What arguments do all the sides in the discussion use?

Conduct research into the origin and the history of your topic. The time range of your investigation will depend on the topic you choose. Some academic discussions go back centuries while others may have started only several years ago. Your research sources may include older textbooks, academic journals, and conference procedures from years past, even articles about your subject written for popular magazines and newspapers and designed to reach non-specialized audiences. As a historian, you will need to cover the following areas:

- What was the first time the topic or issue got significant attention from the professional community? Keep in mind that your job is not necessarily to pinpoint the exact date when the first publication on the topic appeared or the first discussion about it took place, although finding that out certainly will not hurt. Rather, try to find out the general time period when the discussion originated or the topic was attracting attention from academic professionals.
- What events in the academic world and society as a whole may have triggered the discussion of this topic? Since the academic world is a part of society as a whole, academic interests and discussions are usually somehow connected with what society as a whole is interested in and concerned about.
- What are a few key figures and events that contributed to the prominence of the topic or issue you are investigating?
- Can you identify times of paradigm shifts for your subject? What event, both in the academic discipline and in society at large, may have caused significant shifts in people's thinking about the issue?
- Can you try to predict the future development of the discussion? Will it remain an important issue in your discipline or will the discussion end? Why or why not? What factors, events, and people, both in the academic worlds and in society as a whole, may contribute to this? How do you suppose the discussion of the topic will evolve in the future? For example, will the questions and issues at stake be revised and redefined?

Chances are that during your research, you saw some significant developments and shifts in the ways in which your academic discipline has understood and talked about the issues and topic that interest its members.

To illustrate the process of historical investigation of an academic subject, let us look at the hot issue of cloning. What began as a scientific debate years ago has transcended the boundaries of the academic world and is now interesting to various people from various walks of life, and for various reasons. The issue of cloning is debated not only from the scientific, but also from the ethical and legal points of view, to name just a few.

Cloning: Current Perspectives and Discussions

Since I am not a scientist, my interest in the subject of cloning is triggered by an article on stem cell research that I read recently in the popular magazine *Scientific American*. I know that stem cell research is a controversial subject, related to the subject of human cloning. My interest in stem cell research was further provoked by the impassioned speech made by Ron Reagan, the son of the late President Ronald Reagan, at the Democratic Party's National Convention in the summer of 2004. Reagan was trying to make a case for more stem cell research by arguing that it could have helped his father who had died of Alzheimer's disease.

I conducted a quick search of my university library using the key words "human cloning." The search turned up eighty-seven book titles that told me that the topic is fairly important for the academic community as well as for the general public. I noticed that the most recent book on cloning in my library's collection was published this year while the oldest one appeared in 1978. There seemed to be an explosion of interest in the topic beginning in the 1990s with the majority of the titles appearing between then and 2004.

Next, I decided to search two online databases, which are also accessible from my university library's website. I was interested in both scientific and legal aspects of cloning, so I searched the health science database *PubMed* (my search turns up 2,549 results). Next, I search the database *LexisNexis Congressional* that gave me access to legislative documents related to human cloning. This search left me with over a hundred documents. I was able to find many more articles on human cloning in popular magazines and newspapers. By reading across these publications, I would probably be able to get a decent idea about the current state of the debate on cloning.

Cloning: A Historical Investigation
Dolly the sheep was cloned in 1996 by British scientists and died in 2003. According to the website *Science Museum*, "Dolly the sheep became a scientific sensation when her birth was announced in 1997. Her relatively early death in February 2003 fuels the debate about the ethics of cloning research and the long-term health of clones."

I am tempted to start my search with Dolly because it was her birth that brought the issue of cloning to broad pulic's attention. But then I recall the homunculus—a "test-tube" human being that medieval alchemists often claimed to have created. It appears that my search into the history of cloning debate will have to go back much further than 1996 when Dolly was cloned.

Cloning: Signs of Paradigm Shifts
Living in the 21st century, I am skeptical towards alchemists' claims about creating a homunculus out of a bag of bones, skin, and hair. Their stories may have been believable in the middle-ages, though, and may have represented the current paradigm of thinking about the possibility of creating living organisms in a lab. So, I turned to Dolly in an attempt to investigate what the paradigm of thinking about cloning was in the second

half of the 1990s and how the scientific community and the general public received the news of Dolly's birth. Therefore, I went back to my university library's web page and searched the databases for articles on Dolly and cloning published within two years of Dolly's birth in 1996.

After looking through several publications, both from scientific and popular periodicals, I sense excitement, surprise, skepticism, and a little concern about the future implications of our ability to clone living creatures. Writing for *The Sunday Times*, in 1998, Steve Connor says that Dolly would undergo tests to prove that she is, indeed, the clone of her mother. In his article, Connor uses such words as "reportedly" which indicates skepticism (*The Sunday Times*, Feb 8, 1998, p. 9).

In a *New Scientist* article published in January 1998, Philip Cohen writes that in the future scientists are likely to establish human cloning techniques. Cohen is worried that human cloning would create numerous scientific, ethical, and legal problems. (*New Scientist*, Jan 17, 1998 v157 n2117 p. 4(2))

Let's now fast-forward to 2003 and 2004. Surprisingly, at the top of the page of search results is the news that the British biotech company employees cloned Dolly. Does this mean that cloning is dead, though? Far from it! My research shows debates about legal and ethical aspects of cloning. The ability of scientists to clone living organisms is not in doubt anymore. By now, political and ideological groups have added their agendas and their voices to the cloning and stem cell research debate, and the US Congress has enacted legislation regulating stem cell research in the US. The current paradigm of discussions of human cloning and the related subject of stem cell research is not only scientific but also political, ethical, legal, and ideological in nature.

The historical study project as well as my illustration of how such an investigation could be completed should illustrate two things. Firstly, if you believe that something about human cloning or any other topic worth investigating is an undisputable fact, chances are that some years ago it was "only" someone's opinion, or, in Kuhn's words, an "anomaly" that the current system of beliefs and the available research methods could not explain. Secondly, academic and social attitudes towards any subject of discussion and debate are formed and changed gradually over time. Both internal, discipline-specific factors and external, social ones contribute to this change. Such internal factors include the availability of new, more accurate research techniques or equipment. The external factors include, but are not limited to, the general cultural and political climate in the country and in the world. Academic research and academic discussions are, therefore, rhetorical phenomena that are tightly connected not only to the state of an academic discipline at any given time, but also to the state of society as a whole and to the interests, beliefs, and convictions of its members.

Research Activity: Interviewing Academic Professionals

In order to learn more about the conventions of academic discourse, interview a professor at your college. You may wish to talk to one of the teachers whose classes you are currently taking. Or you may choose to interview a teacher whom you do not yet know personally, but who teaches a course that interests you or who works in an academic major that you are considering. In either case, the purpose of your interview will be to learn about the conventions of research and writing in your interlocutor's academic discipline. You can design your own interview questions. To get you started, here are three suggestions:

- Ask to describe, in general, the kinds of research and writing that professionals in that academic field conduct. Focus on research goals, methods, and ways in which research results are discussed in the field's literature.
- Discuss how a specific text from the academic discipline, such as a book or a journal article,

reflects the principles and approaches covered in the first question.

- Ask for insights on learning the discourse of the discipline.

Establishing Authority in Academic Writing by Taking Control of Your Research Sources

Good writing is authoritative. It shows that the author is in control and that they are leading the readers along the argument by skillfully using research sources, interpreting them actively and creatively, and placing the necessary signposts to help the readers anticipate where the discussion will go next. Authoritative writing has its writing and its writer's voice present at all times. Readers of such writing do not have to guess which parts of the paper they are reading come from an external source and which come from the author themself.

The task of conveying authority through writing faces any writer since it is one of the major components of the rhetorical approach to composing. However, it is especially relevant to academic writing because of the context in which we learn it and in which it is read and evaluated.

We come to academic writing as apprentices not only in the art of composing but also in the academic discipline that we are studying. We face two challenges at the same time. On the one hand, we try to learn to become better writers. On the other, we study the content of our chosen academic disciplines that will become the content of our academic writing itself. Anyone entering college, either as an undergraduate or a graduate student, has to navigate the numerous discourse conventions of their academic discipline. We often have too little time for such navigation as reading, writing, and research assignments are handed to us soon after our college careers begin. In these circumstances, we may feel insecure and unsure of our previous knowledge, research, and writing expertise.

In the words of writing teacher and writer David Bartholomae, every beginning academic writer has to "invent the university." What Bartholomae means by this quote is, when becoming a member of an academic community, such as a college or a university, each student has to understand what functioning in that community will mean personally for them and what conventions of academic reading, writing, and learning they will be expected to fulfill and follow. Thus, for every beginning academic writer, the process of learning its conventions is akin to inventing their own idea of what university intellectual life is like and how to join the university community.

Beginning research and academic writers let their sources control their writing too often. I think that the cause of this is the old idea, inherent in the traditional research paper assignment, that researched writing is supposed to be a compilation of external sources first and a means for the writer to create and advance new knowledge second, if at all. As a result, passages, and sometimes whole papers written in this way lack the writer's presence and, as a consequence, they lack authority because all they do is re-tell the information presented in sources. Consider, for example, the following passage from a researched argument in favor of curbing video game violence. In the paper, the author is trying to make a case that a connection exists between violence on the video game screen and in real life. The passage below summarizes some of the literature:

> The link between violence in video games and violence in real life has been shown many times (Abrams 54). Studies show that children who play violent video games for more than two hours each day are more likely to engage in violent behavior than their counterparts who do not (Smith 3). Axelson states that some video games manufacturers have recognized the problems by reducing the violence in some of their titles and by rating their games for different age groups (157). The government has instituted a rating system for videogames similar to the one used by the movie industry in an effort to protect your children from violence on the screen (Johnson 73). Alberts and Cohen say that we will have to wait and see whether this rating system will prove to be effective in curbing violence (258).

This passage lacks authority because every sentence in it is taken from an external source. Where is the writer in this paragraph? Where are the writer's voice and interpretations of the research data? What new insights about the possible connection between video games and real-life violence do we get from this author? Is there anything in this passage that we could not have learned by reading the sources mentioned in this paper? This writer has let external sources control the writing by composing an entire paragraph (and the rest of the paper is written in the same way) out of external source segments, and nowhere in this passage do we see the author's own voice, persona, or authority.

So, how can the problem of writing without authority and without voice be solved? There are several ways, and the checklist below provides you with some suggestions:

- Always remember to use research for a rhetorical purpose—to create new knowledge and convey it to your readers. Except in rare cases, writers are not compilers of existing information. Resist the urge to limit your research to simply summarizing and quoting external sources. Therefore, your ultimate purpose is to create and express your own theories and opinions about your topic.
- Talk to academics or professionals to find out what constitutes authoritative writing in their field. It could be the presence of a strong voice, or the use of particular research methods and techniques, or a certain way to present the results of your research.
- Create annotated bibliographies to make sense of your research and make the ideas and theories you read about your own.
- Use only reliable sources.

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Attributions

13.

CREATING AN ANNOTATED BIBLIOGRAPHY

by Pavel Zemliansky

Purpose

Creating an annotated bibliography of your research sources can help you take control of them and put your own voice and personality back into your research writing. Unlike conventional bibliographies that simply provide information about the work's author, title, publisher, and so on, each entry of an annotated bibliography briefly summarizes an entry and then evaluates its possible application to research and writing.

According to Owen Williams, a librarian at the library of the University of Minnesota, annotated bibliographies are created with the following purposes:

- To review literature on a particular subject
- To illustrate the quality of research that you have done
- To provide examples of the types of sources available
- To describe other items on the topic that might be of interest to the reader

Williams then provides an example of an entry from an annotated bibliography:

> Sewell, W. (1989). Weaving a program: Literate programming in WEB. New York: Van Nostrand Reinhold.
>
> Sewell explains the code language within these pages including certain lines of code as examples. One useful idea that Sewell uses is to explain characters and how they work in the programming of a web page. He also goes through and describes how to make lists and a title section. This will be very useful because all web pages have a title section. This author also introduces Pascal, which I am not sure if I will include in my manual but after I read more about it, I can decide whether this will be helpful to future users. This book will not be the basis of my manual but will add some key points, which are described above.

Note that the author of this entry not only summarizes the content of a source, but also evaluates the usefulness of this source for a specific research project. Annotated bibliographies are not just exercises in the rules of citation. Instead, they help writers to begin the transition from reading sources into

writing about them. By combining evaluation with description, annotated bibliographies help writers approach their research actively by beginning to make sense of their sources early in the research process.

Process

Begin a research project by collecting and annotating possible sources. Remember that not all the sources that your annotated bibliography will include may end up in your final paper. This is normal since researchers cast their nets much wider in the beginning of a project than the range of sources that they eventually include in their writing. The purpose of creating an annotated bibliography is to learn about the available resources on your subject and to get an idea how these resources might be useful for your particular writing project. As you collect your sources, write short summaries of each of them. Also try to apply the content of these sources to the project you are working on. Don't worry about fitting each source exactly into what you think your project will be like. Remember that, in the process of research, you are learning about your subject, and that you never really know where this learning process takes you.

Attributions

14.

WRITING A SUMMARY

by Suzan Last

An academic summary provides an objective, condensed (shortened) description of the content of a piece of writing or presentation. Unlike a review, it does NOT analyze, evaluate, or critique; your opinion of the work is not typically part of the summary (unless you have been asked to *add* your thoughts afterward). Since summaries usually occur within a context (eg., part of your essay), your thoughts about what you have summarized will probably be relevant to your subsequent analysis. But when writing the actual summary of someone else's ideas, you must neutrally and accurately describe what you take to be the important ideas in the author's or presenter's work in as few words as possible. Occasionally, if the work you are summarizing has an unusual form, style, or tone that affects the content, your summary might describe HOW the author presents those ideas.

What is the Purpose of a Summary?

A summary is meant to **inform** your reader—who **has not read** the text or seen the presentation—of what the text is about. It describes its purpose or main idea and summarizes the supporting arguments that develop that idea. Readers will then know if they will find it useful and want to read it.

There are many kinds of summaries that serve different purposes:

- An **academic summary** of someone else's ideas, in the context of a research essay, helps you to support and develop your ideas. You may summarize someone's ideas because they support your own or because they differ from yours and allow you to introduce the idea you want to argue. Someone else's theory may provide a framework for your analysis, so you might summarize the theory before beginning your argument. A summary can act as a springboard to launch your ideas.
- An **abstract**, written by the author(s) of the paper, describes the content and purpose of an academic paper and is included at the beginning of the article. Abstracts are written by the authors and thus do not use signal phrases.
- Government workers often write **briefing notes** to give the busy ministers and directors a summary of important information needed for a meeting or for a decision.

- In business, an **executive summary** gives the busy executive a quick overview of the contents of a formal report.

Being able to write a clear and useful summary is a valuable skill both in academic and professional contexts.

How Do You Write an Effective Summary?

Before you can summarize anything, you must understand the content of what you are summarizing and do some pre-writing. Some of the most common flaws in summaries come from not completing these pre-writing steps. For example, some summary writers get bogged down in the small details and neglect to present the main idea; or they present a series of unconnected thoughts that come directly from the source but do not coherently indicate what that source was about or how ideas were developed. Occasionally, a writer may summarize the structure of a text instead of the ideas in that text. These errors could occur because the pre-writing work was done poorly.

Pre-writing Stage

- **Actively read the article or pay attention to the presentation.** Make notes. Make sure you understand what you are summarizing: what is its main purpose? What is the "thesis"? What are the main points that support the thesis? Explain it verbally to someone else based on your notes. Use your own words to make sure you really understand what you have read or seen.
- **Reread** the article (or your notes on the presentation or the slides if they have been provided) and break it up into sections or "stages of thought." Briefly summarize each section and indicate how it relates to the main idea. Again, paraphrase using your own words. Except for the occasional key word or phrase, avoid quoting directly.
- Keep your purpose and intended audience in mind when you design your summary; remember, your intended reader has not read the article or seen the presentation. Why are you summarizing it? Why is your audience reading your summary?

Writing Stage

Now you are ready to begin writing your summary. Follow these steps:

STEP 1

Provide the author's name and title of the text being summarized. If you are summarizing a speaker's presentation, give the presenter's name and the title or topic of the presentation. If context is important to your summary, give some details about the intended audience, etc.

> In "Can Ethics be Technologized?" Peter Dombrowski [1] critiques the idea that …

STEP 2

Paraphrase (write in your own words) the author's **thesis** or main idea:

> … the idea that ethics can be reduced to an objective formula or algorithm that can implemented in any given situation.

STEP 3

Describe, in a neutral and objective manner, how the author supports and develops the main idea. Do not editorialize (evaluate, critique, analyze, etc.); simply describe. Keep the following in mind:

- Summarize the key points used to develop the main idea.
- Leave out minor details and examples that are not critical to the main idea.
- Do not quote from the article or limit quotations to a single key word or important phrase. Padding your summary with quotations does not effectively condense and summarize.
- Use signal phrases, such as "Dombrowski explains" and "Dombrowski asserts" to show that the ideas are not yours, but that they come from the article you are summarizing. **Do not accidentally plagiarize.** In other words, d*o not inadvertently present the author's ideas as your own*.
- Pay attention to **verb tense**: summaries of *ideas* are generally given in the present tense, while results and findings are often given in the past tense.
- Dombrowski *explains* … (present tense)
- Hollander's study *found* that … (past tense)
- Summaries of presentations are generally given in the past tense, since the presentation happened only once in the past, while a text can be read and reread several times, making it more "present." However, a video presentation, such as a TED Talk, would likely be summarized in present tense, much like an article, because it can be reviewed over and over again. Which verb tense you should use is not subject to absolute rules; you will have to use some judgment to determine what sounds best (and avoid what sounds awkward).
- Cite and document your source using a consistent citation style guide like MLA or IEEE.

Example Reference in IEEE

[1] P.M. Dombrowski. "Can ethics be technologized? Lessons from Challenger, philosophy, and rhetoric." In *IEEE Transactions of Professional Communication,* vol. 38.3, Sept. 1995, pp. 146-50 . DOI: 10.1109/47.406727

Rewriting Stage

Review and revise your draft using the following steps:

- *Revise content and organization:* Is it complete? Should you add any important details? Is it well organized? Does it follow the order of the original text? Can you get rid of any unnecessary content? Have you used your own words and phrasing? Have you used signal verbs to indicate what ideas belong to the summarized source?

- *Edit for flow:* Do ideas flow smoothly together creating a logical sequence of ideas? Are sentences clear, concise, correct, and coherent? Or do they require effort to decode? Do transitions effectively indicate the relationships between ideas? Have you effectively introduced, developed, and concluded?
- *Proofread*: Look for mechanical errors (typos, spelling, punctuation), and for grammar and usage errors that may have crept in during revision and editing.

Signal Phrases

Signal phrases allow you to clearly indicate when words, phrases, and ideas you include in your writing come from someone else. These include verbs that introduce summaries, paraphrases, and quotations. In general, it is best to avoid bland, generic verbs like

- says (too vague)
- writes (too vague)
- talks about (too informal)

Instead, use a verb that more precisely and accurately describes the author's rhetorical intention—describe what the author is DOING in this quotation, or what rhetorical purpose the author is trying to achieve. Figure 14.2 contains a useful table of Signal Verbs for various purposes.

"I Can't See the Forest for the Trees"

A summary should move from a statement of the **general purpose** to the **specific ideas** used to develop that purpose; it should be neither too vague nor too specific. There is an expression: "I can't see the forest for the trees." It means you get too focused on the details so you miss the big picture. You don't want to be too general or too detailed. You want to give an accurate description of the forest as a whole and quickly go over the main characteristics of the types of trees that comprise it (the key examples used to illustrate the main idea). Don't let your summary get bogged down in the minor details, specific examples, and precise data (the species of fungus on the leaves of the trees).

Attributions

15.

INTEGRATING SOURCE EVIDENCE INTO YOUR WRITING

by Suzan Last and Candace Neveu

Writing in an academic context often entails engaging with the words and ideas of other authors. Therefore, being able to correctly and fluently incorporate and engage with other writers' words and ideas in your own writing is a critical academic skill. There are three main ways to integrate evidence from sources into your writing: quoting, paraphrasing, and summarizing. Each form requires a citation because you are using another person's words and/or ideas. Even if you do not quote directly but paraphrase source content and express it in your own words, you still must give credit to the original authors for their ideas. Similarly, if you quote someone who says something that is "common knowledge," you still must cite this quotation, as you are using their sentence's structure, organizational logic, and/or syntax.

Integrating Quotations

WHY?

Using direct quotations in your argument has several benefits:

- Integrating quotations provides direct evidence from reliable sources to support your argument.
- Using the words of credible sources conveys your credibility by showing you have done research into the area you are writing about and consulted relevant and authoritative sources.
- Selecting effective quotations illustrates that you can extract the important aspects of the information and use them effectively in your own argument.

WHEN?

Be careful not to over-quote. Quotations should be used sparingly because too many quotations can interfere with the flow of ideas and make it seem like you don't have ideas of your own. Paraphrasing can be more effective in some cases.

So when should you use quotations?

- If the language of the original source uses the best possible phrasing or imagery, and no paraphrase or summary could be as effective; or
- If the use of language in the quotation is itself the focus of your analysis (*e.g.,* if you are analyzing the author's use of a particular phrasing, imagery, metaphor, or rhetorical strategy).

How to Integrate Quotations Correctly

Integrating quotations into your writing happens on two levels: argumentative and grammatical. At the argument level, the quotation is being used to illustrate or support a point that you have made, and you will follow it with some analysis, explanation, comment, or interpretation that ties that quote to your argument. ***Never quote and run***: don't leave your reader to determine the relevance of the quotation. A quotation, statistic, or bit of data generally does not speak for itself; you must provide context and an explanation for quotations you use. Essentially, you should create a "quotation sandwich" (see **Figure 15.1**). Remember the acronym I.C.E. → Introduce, Cite, Explain.

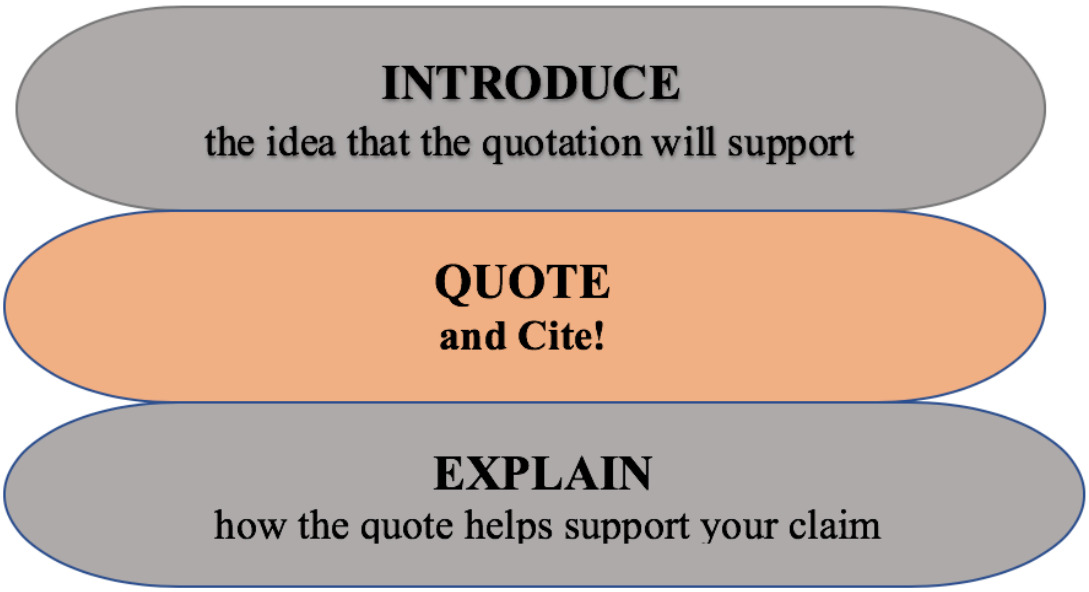

Figure 15.1

The second level of integration is grammatical. This involves integrating the quotation into your own sentences so that it flows smoothly and fits logically and syntactically. There are three main methods to integrate quotations grammatically:

- **Seamless Integration Method:** embed the quoted words as if they were an organic part of your sentence (if you read the sentence aloud, your listeners would not know there was a quotation).
- **Signal Phrase Method:** use a signal phrase (Author + Verb) to introduce the quotation, clearly indicating that the quotation comes from a specific source.
- **Colon Method:** introduce the quotation with a complete sentence ending in a colon.

Consider the following opening sentence (and famous comma splice) from *A Tale of Two Cities* by Charles Dickens, as an example:

> "It was the best of times, it was the worst of times"

Seamless Integration: embed the quotation, or excerpts from the quotation, as a seamless part of your sentence.

> Charles Dickens begins his novel with the paradoxical observation that the eighteenth century was both "the best of times" and "the worst of times" [1].

Signal Phrase: introduce the author and then the quote using a signal verb (scroll down to Table 15.2 to see a list of common verbs that signal you are about to quote someone).

> Describing the eighteenth century, Charles Dickens observes, "It was the best of times, it was the worst of times" [1].

Colon: if your own introductory words form a complete sentence, you can use a colon to introduce and set off the quotation. This can give the quotation added emphasis.

> Dickens defines the eighteenth century as a time of paradox: "It was the best of times, it was the worst of times" [1].

> The eighteenth century was a time of paradox: "It was the best of times, it was the worst of times" [1].

Editing Quotations

When you use quotation marks around material, this indicates that you have used the ***exact*** words of the original author. However, sometimes the text you want to quote will not fit grammatically or clearly into your sentence without making some changes. Perhaps you need to replace a pronoun in the quote with the actual noun to make the context clear, or perhaps the verb tense does not fit. There are two key ways to edit a quotation to make it fit grammatically with your own sentence:

- **Use square brackets**: to reflect changes or additions to a quote, place square brackets around any words that you have changed or added.
- **Use ellipses** (3 dots): to show that some text has been removed, use the ellipses. Three dots

indicate that some words have been removed from the sentence; 4 dots indicate that a substantial amount of text has been deleted, including the period at the end of a sentence.

Sample Quotation, Citation, and Reference

> Engineers are always striving for success, but failure is seldom far from their minds. In the case of Canadian engineers, this focus on potentially catastrophic flaws in a design is rooted in a failure that occurred over a century ago. In 1907 a bridge of enormous proportions collapsed while still under construction in Quebec. Planners expected that when completed, the 1,800-foot main span of the cantilever bridge would set a world record for long-span bridges of all types, many of which had come to be realized at a great price. According to one superstition, a bridge would claim one life for every million dollars spent on it. In fact, by the time the Quebec Bridge would finally be completed, in 1917, almost ninety construction workers would have been killed in the course of building the $25 million structure" [3].

[3] H. Petroski, "The Obligation of an Engineer," in To Forgive Design, Boston: Belknap Press, 2014, p. 175.

You are allowed to change the original words, to shorten the quoted material, or to integrate material grammatically, but only if you signal those changes appropriately with square brackets or ellipses:

- **Example 1:** Petroski observed that "[e]ngineers are always striving for success, but failure is seldom far from their minds" [3; p. 175].
- **Example 2:** Petroski recounts the story of a large bridge that was constructed at the beginning of the twentieth century in Quebec, saying that "by the time [it was done], in 1917, almost ninety construction workers [were] killed in the course of building the $25 million structure" [3; p. 175].
- **Example 3:** "Planners expected that when completed the … bridge would set a world record for long-span bridges of all types" [3; p. 175].

Integrating Paraphrases and Summaries

Instead of using direct quotations, you can paraphrase and summarize evidence to integrate it into your argument more succinctly. Both paraphrase and summary require you to read the source carefully, understand it, and then rewrite the idea in your own words. Using these forms of integration demonstrates your understanding of the source because rephrasing requires a good grasp of the core ideas. Paraphrasing and summarizing also make integrating someone else's ideas into your own sentences and paragraphs a little easier, as you do not have to merge grammar and writing style—you don't need to worry about grammatical integration of someone else's language.

Paraphrase and summary differ in that paraphrases focus on a smaller, specific section of text that when paraphrased may be close to the length of the original. Summaries, on the other hand, are condensations of large chunks of text, so they are much shorter than the original and capture only the main ideas.

Sample Paraphrase

> At the end of its construction, the large cantilever bridge cost $25 million dollars, but the cost in lives lost far exceeded the prediction of one death for each million spent. While the planners hoped that the bridge would set a global record, in fact its claim to fame was much more grim [3].

Sample Summary

> According to Petroski, a large bridge built in Quebec during the early part of the twentieth century claimed the lives of dozens of workers during its construction. The collapse of the bridge early in its construction represented a pivotal design failure for Canadian engineers that shaped the profession [3].

Regardless of whether you are quoting, paraphrasing, or summarizing, you must cite your source any time you use someone else's intellectual property—whether in the form of words, ideas, language structures, images, statistics, data, or formulas—in your document.

Using Signal Verbs

Verbs like "”says," "writes" or "discusses" tend to be commonly over-used to signal a quotation and are rather vague. In very informal situations, people use "talks about" (avoid "talks about" in formal writing). These verbs, however, do not provide much information about the *rhetorical purpose* of the author.

The list of signal verbs below offers suggestions for introducing quoted, paraphrased, and summarized material that convey more information than verbs like "says" or "writes" or "discusses." When choosing a signal verb, try to indicate the author's rhetorical purpose: what is the author ***doing*** in the quoted passage? Is the author *describing* something? *Explaining* something? *Arguing*? *Giving examples? Estimating? Recommending? Warning*? *Urging?* Be sure the verb you choose accurately represents the intention of the source text. For example, don't use "concedes" if the writer isn't actually conceding a point. Look up any words you don't know and add ones that you like to use.

Table 15.2: Commonly used signal verbs

Making a claim	Recommending	Disagreeing or Questioning	Showing	Expressing Agreement	Additional Signal Verbs
argue	advocate	challenge			
assert	call for	complicate	illustrates	agree	responds
believe	demand	criticize	conveys	admire	assumes
claim	encourage	qualify	reveals	endorse	speculates
emphasize	exhort	counter	demonstrates	support	debates
insist	implore	contradict	proposes	affirm	estimates
remind	plead	refute	points out	corroborate	explains
suggest	recommend	reject	exemplifies	verify	implies
hypothesize	urge	deny	indicates	reaffirm	uses
maintains	warn	question			

Be careful with the phrasing after your signal verb. In some cases, you will use the word "that" to join the signal phrase to the quotation:

> Smith argues **that** "bottled water should be banned from campus" [1].

But not all signal verbs can be followed by "that."

We can use clauses with ***that*** after these verbs related to thinking:

Think I think ***that*** you have an excellent point.

Believe He believes ***that*** unicorns exist.

Expect She expects ***that*** things will get better.

Decide He decided ***that*** it would be best to buy the red car.

Hope I hope ***that*** you know what you are doing.

Know I know ***that*** you will listen carefully

Understand She understood ***that*** this would be complicated.

And after verbs related to saying:

Say She said ***that*** she would be here by 6:00 pm.

Admit He admits ***that*** the study had limitations.

Argue She argues ***that*** bottled water should be banned on campus.

Agree He agrees ***that*** carbon taxes are effective.

Claim They claim ***that*** their methods are valid.

Explain He explained ***that*** the rules are complicated.

Suggest They suggest ***that*** you follow instructions carefully.

But some verbs require an ***object*** (a person or thing) before you can use "that":

Tell tell ***a person*** that… tell ***asstory***… tell ***the truth***

Describe describe ***the mechanism***

Convince convince ***an audience*** that you are credible

Persuade persuade ***a reader*** that this is a worthwhile idea

Inform inform ***a colleague*** that their proposal has been accepted

Remind remind ***the client*** that …

Analyze analyze ***a process***; analyze ***a text***; analyze ***the problem***

Summarize summarize ***a text***; summarize ***an idea***

Support I support ***the idea*** that all people are created equal

It would be **incorrect** to write the following:

The author persuades that …x

The writers convince that … x

The speaker expressed that …x

He analyzes that …x

She informs that … x

They described that …x

I support that … x

Attributions

16.

CONCLUSIONS

by Pavel Zemliansky

As a college student, you are probably taking four, five, or even six classes simultaneously. In many, if not all of those classes you are probably required to conduct research and produce research-based writing. Below, I would like to offer a practical checklist of approaches, strategies, and methods that you can use for academic research and writing:

- Approach each research writing assignment rhetorically. Learn to recognize its purpose, intended audience, the context in which you are writing, and the limitations that this context will impose on you as a writer. Also, treat the format and structural requirements, such as the requirement to cite external sources, as rhetorical devices that will help you to make a bigger impact on your readers.
- Try to understand each research and writing assignment as best as you can. If you receive a written description of the assignment, read it several times and discuss it with your classmates and your instructor. If in doubt about some aspect of the assignment, ask your instructor.
- Develop and use a strong and authoritative voice. Make your sources work for you, not control you. When you write, it is your theories and your voice that counts. Research helps you form and express those opinions.
- Becoming a good academic researcher and writer takes time, practice, and rhetorical sensitivity. It takes talking to professionals in academic fields, such as your college professors, reading a lot of professional literature, and learning to understand the research and writing conventions of each academic discipline. To learn to function as a researcher and writer in your chosen academic discipline or profession, it is necessary to understand that research and writing are governed by discourse and community conventions and not by rigid and artificial rules.

Attributions

17.

ETHICS AND DOCUMENTING SOURCES

by Michael Beilfuss

General Principles

In day-to-day life, most people have a sort of sliding scale on what constitutes ethical behavior. For example, you might tell your best friend their new haircut looks attractive when in fact you believe that it does not. This lie, though minor, preserves your friend's feelings and does no apparent harm to them or anyone else. Some might consider the context before determining how to act. For example, you might not tell a stranger that they were trailing toilet paper, but you would tell a friend. With a stranger, your calculations may include how the stranger might respond to the interruption, and both of you may feel some embarrassment in the exchange. Such calculations may make it easier for you to look away and let someone else deal with it, but with a friend, you would be willing to risk some short-term awkwardness to do the right thing.

In a far more serious situation, a person might not risk their lives to help a stranger, but they might risk their lives to help a close friend or relative. For example, if you witness a stranger attacking someone you do not know on a crowded street, you may be afraid to interfere because you could be injured in the event. Instead, you might stay back and call the police. But if a close friend or a relative was in the same danger, you may be more likely to put yourself in harm's way to protect your friend. In this case, your commitment to loyalty might outweigh your sense of self-preservation. In the former case, if you valued physical courage above all else, you might be willing to step into a fight to protect a victim. In either case, weighing the costs and having a strong value system would help you feel like you did the right thing—especially upon reflection after the event.

Ethical behavior, including ethical technical communication, involves not just telling the truth and providing accurate information, but telling the truth and providing information so that a reasonable audience is made aware of the behavior. It also means that you act to prevent actual harm with set criteria for what kinds and degrees of harm are more serious than others.

For example, saving someone's life should always outweigh the prospect of financial damage to your company. Human values, and human life, are far more important than monetary values and financial gain. As a guideline, ask yourself what would happen if your action (or non-action) became entirely

public and started trending on social media, got its own hashtag, and became a meme picked up by the national media. If you would go to prison, lose your friends, lose your job, or even just feel embarrassed, the action is probably unethical. If your actions cannot stand up to that scrutiny, you might reconsider them. Having a strong ethical foundation always helps.

However, nothing is ever easy when it comes to ethical dilemmas. Sometimes the right thing to do is the unpopular thing to do. Just because some action enjoys the adulation of the masses does not necessarily mean it is appropriate. As such, it is important to give some serious thought to your own value system and how it may fit into the value systems of the exemplars you admire and respect. That way, you will be better prepared to do the right thing when you are confronted with a moral dilemma. Internalizing your principles in such a manner will certainly make you a more ethical writer.

Presentation of Information

How a writer presents information in a document can affect a reader's understanding of the relative weight or seriousness of that information. For example, hiding some crucial bit of information in the middle of a long paragraph deep in a long document seriously de-emphasizes the information. On the other hand, putting a minor point in a prominent spot (say the first item in a bulleted list in a report's executive summary) might be a manipulative strategy to emphasize information that is not terribly important. Both of these examples could be considered unethical, as the display of information is crucial to how readers encounter and interpret it.

A classic example of unethical technical writing is the memo report NASA engineers wrote about the problem with O-ring seals on the space shuttle Challenger. The unethical feature was that the crucial information about the O-rings was buried in a middle paragraph, while information approving the launch was in prominent beginning and ending spots. Presumably, the engineers were trying to present a full report, including safe components in the Challenger, but the memo's audience—non-technical managers—mistakenly believed the O-ring problem to be inconsequential, even if it happened. The position of information in this document did not help them understand that the problem could be fatal.

Ethical writing, then, involves being ethical, of course, but also presenting information so that your target audience will understand the relative importance of information and understand whether some technical fact is a good thing or a bad thing.

Ethical Issues in Technical Communication

There are a few issues that may come up when researching a topic for the business or technical world that a writer must consider. Let us look at a few.

Research that Does Not Support the Project Idea

In a technical report that contains research, a writer might discover conflicting data that does not support the project's goal. For example, your small company continues to have problems with employee morale. Research shows bringing in an outside expert, someone who is unfamiliar with the company and the stakeholders, has the potential to impact the greatest change. You discover,

however, that to bring in such an expert is cost prohibitive. You struggle with whether to leave this information out of your report—thereby encouraging your employer to pursue an action that is not the most productive. In this situation, what would you do and why?

Suppressing Relevant Information

Imagine you are researching a report for a parents' group that wants to change the policy in the local school district, which requires all students to be vaccinated. You collect a handful of sources that support the group's goal, but then you discover convincing medical evidence that indicates vaccines do more good than potential harm in society. Since you are employed by this parents' group, should you leave out the medical evidence, or do you have a responsibility to include all research—even some that might sabotage the group's goal? Is it your responsibility to tell the truth (and potentially save children's lives) or to cherry pick information that supports the parent group's initial intentions?

Limited Source Information in Research

Thorough research requires a writer to integrate information from a variety of reliable sources. These sources should demonstrate that the writer has examined the topic from as many angles as possible. This includes gathering scholarly and professional research from a variety of databases or journals rather than favoring one resource. Using a variety of sources helps the writer avoid potential bias that can occur from relying on only a few experts. If you were writing a report on the real estate market in Stillwater, Oklahoma, you would not collect data from only one broker's office. While this office might have access to broader data on the real estate market, as a writer you run the risk of looking biased if you only choose materials from this one source. Collecting information from multiple brokers would demonstrate thorough and unbiased research.

Presenting Visual Information Ethically

Visuals can be useful for communicating data and information efficiently for a reader. They provide data in a concentrated form, often illustrating key facts, statistics, or information from the text of the report. When writers present information visually, however, they have to be careful not to misrepresent or misreport the complete picture.

The graphic below shows two perspectives of information in a pie chart. The data in each is identical, but the pie chart on the left presents information in a misleading way (see Figure 17.1). What do you notice, however, about how that information is conveyed to the reader?

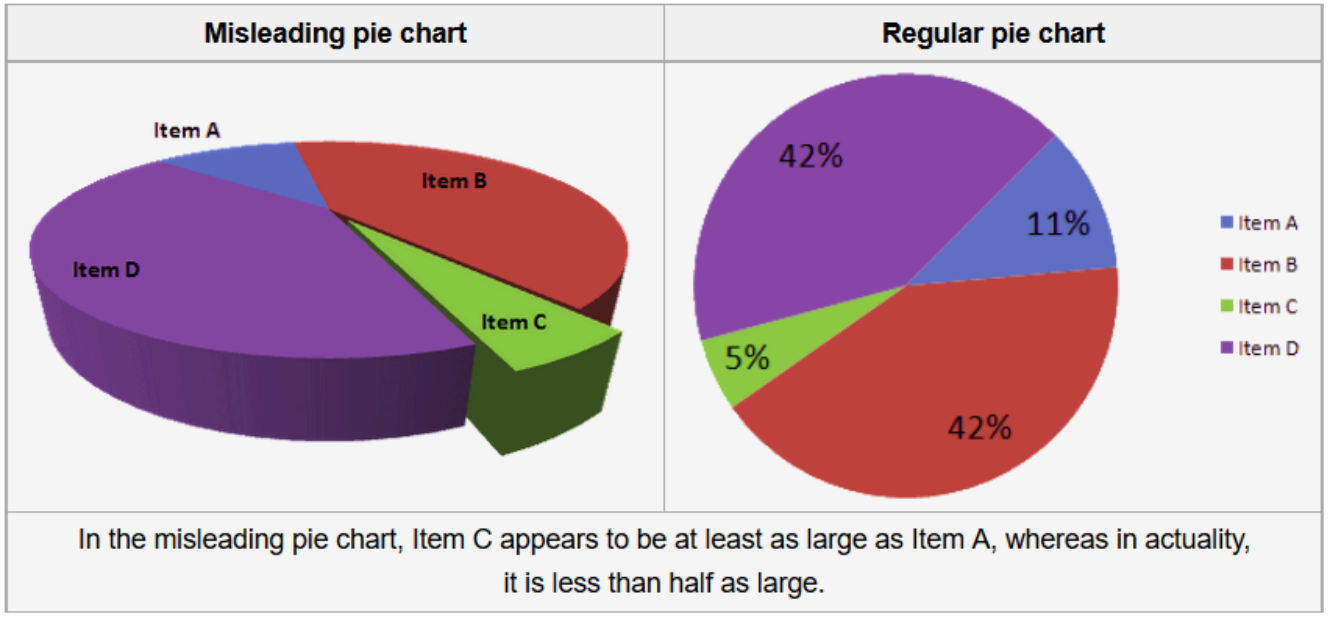

Figure 17.1

Imagine that these pie charts represented donations received by four candidates for city council. The candidate represented by the green slice labeled "Item C" might think that she had received more donations than the candidate represented in the blue, "Item A" slice. In fact, if we look at the same data in a differently oriented chart, we can see that Item C represents less than half of the donations than those for Item A. Thus, a simple change in perspective can change the impact of an image.

Similarly, take a look at the bar graphs in Figure 17.2 below. What do you notice about their presentation?

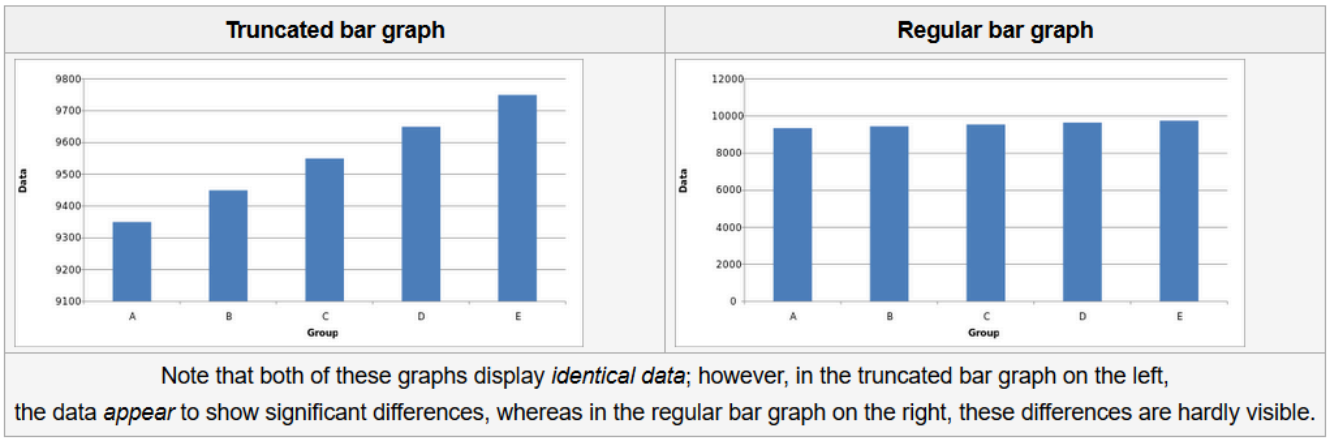

Figure 17.2

If the bar graph above were to stand for sales figures for a company, the representation on the left would look like good news: dramatically increased sales over a five-year period. However, a closer look at the numbers shows that the graph displays only a narrow range of numbers in a limited perspective (9100 to 9800). The bar graph on the right, on the other hand, exhibits the complete picture by presenting numbers from zero to 1200 on the vertical axis, and we see that the sales figures have in fact been relatively stable for the past five years.

Presenting data in graphical form can be especially challenging. Keep in mind the importance of providing appropriate context and perspective as you prepare your graphics. You need to be extra vigilant to avoid misleading your readers with graphics. Graphics will usually be the first thing a reader notices about your document; if a reader finds your images misleading, your entire document may be called into question.

Additional Concerns

You might notice that most of these ethics violations could happen accidentally. Directly lying is unlikely to be accidental, but even in that case, the writer could rationalize and/or persuade themselves that the lie achieved some "greater good" and was therefore necessary. This is a slippery slope.

An even more common ethics violation results from the person who designs the information mistakenly believing that they are presenting evidence objectively—without recognizing their own bias in how they presented that information.

Most ethics violations in technical writing are (probably) unintentional, but they are still ethics violations. That means a technical writer must consciously identify their biases and check to see if a bias has influenced any presentation: whether in charts and graphs, or in discussions of the evidence, or in source use (or, of course, in putting the crucial O-ring information where the launch decision makers would realize it was important).

For example, scholarly research is intended to find evidence that the new researcher's ideas are valid (and important) or evidence that those ideas are partial, trivial, or simply wrong. In practice, though, most folks are primarily looking for support: "Hey, I have this great new idea that will solve world hunger, cure cancer, and make mascara really waterproof. Now I just need some evidence to prove I am right!" This demonstrates one version of confirmation bias, where people tend to favor evidence that supports their preconceived notions and reject evidence that challenges their ideas or beliefs.

On the other hand, if you can easily find 94 high-quality sources that confirm you are correct, you might want to consider whether your idea is worth developing. Often in technical writing, the underlying principle is already well-documented (maybe even common knowledge for your audience) and the point *should* be to use that underlying principle to propose a specific application.

Using a large section of your report to prove an already established principle implies that you are saying something new about the principle—which is not true. Authors of technical documents typically do not have the time or space to belabor well-known points or common-sense data because readers do not need to read page upon page of something they already know or something that can be proven in a sentence or two. When you use concepts, ideas, or findings that have been established by others, you only need to briefly summarize your source and provide accurate references. Then you can apply the information from your source(s) to your specific task or proposal.

Ethics and Documenting Sources

The most immediate concern regarding ethics in your technical writing course is documenting your sources. Whatever content you borrow must be clearly documented both in the body of your text and in a Works Cited or References page (the different terms reflect different documentation systems, and not just random preference) at the end.

Including an item only in the source list at the end suggests you have used the source in the report, but if you have not cited this source in the text as well, you could be seen as misleading the reader. Either you are saying it is a source when in fact you did not really use anything from it, or you have simply failed to clarify in the text what are your ideas and what comes from other sources.

Documenting source use in such a way as to either mislead your reader about the source or make identifying the source difficult is also unethical—that would include using just a URL or even an article title without identifying the journal in which it appears (in the Works Cited/References; you would not likely identify the journal name in the report's body). It would also be unscrupulous to falsify the nature of the source, such as omitting the number of pages in the Works Cited entry to make a brief note seem like a full article.

Dishonest source use includes suppressing information about how you have used a source like not making it clear that graphical information in your report was already a graph in your source, as opposed to a visualization you created based on information within the source.

With the ease of acquiring graphics on the internet, it has become ever more tempting to simply copy and paste images from a search engine. Without providing accurate citation information, the practice of cutting and pasting images is nothing less than plagiarism (or theft); it is unethical and may be illegal if it violates copyright law. Furthermore, it is downright lazy. Develop good habits now and maintain them through practice. Properly cite your images by providing credit to the original creator of the image with full citations. You cannot just slap a URL under a picture, but rather you need to give full credit with an appropriate citation. Any assignment turned in that uses material from an outside source, including graphics and images, needs to include in-text citations as well as a list of references.

What about Open-Source Images?

If you need to use graphics from the internet, a good option is to look for graphics that are open source. Open source refers to material that is freely available for anyone to use. Creative Commons is an organization that has developed guidelines to allow people to "share their knowledge and creativity." They provide "free, easy-to-use copyright licenses to make a simple and standardized way to give the public permission to share and use" creative work ("What we Do"). There are a number of options that a creator has in regard to how they want to set up permissions, but the idea is that these works are free for anyone to use; they are open source.

Graphics created by the federal government, say from the National Park Service or the FDA or the EPA, are not under copyright and therefore can be used without having to go through the sometimes-onerous process of securing permissions. This is particularly helpful for written materials that will be professionally published.

Likewise, you can customize a Google image search so that only images that are open source will come up. If you click on the "Tools" button, you have the option of filtering results by how they are licensed. See Figure 17.3.

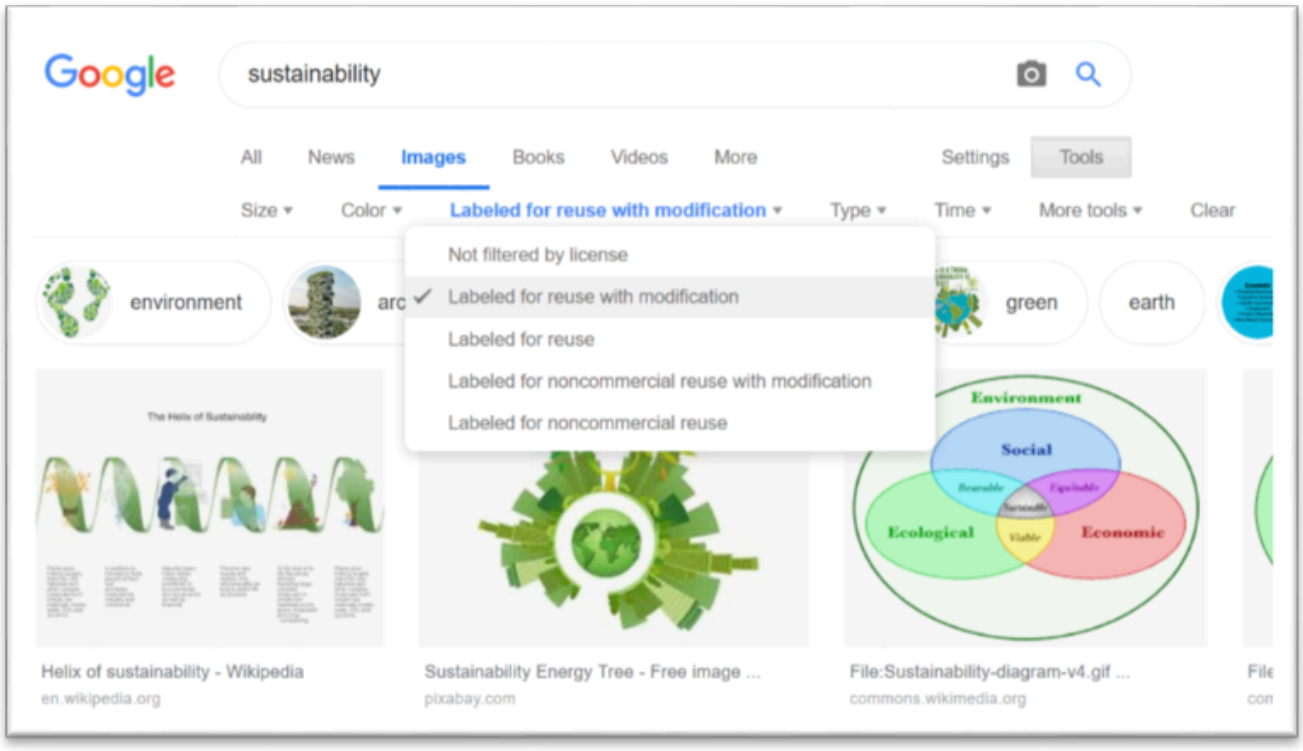

Figure 17.3

Regardless of the copyright, you should always keep track of where you found the graphics, and for assignments for your class, you need to record the source so you can cite it. If you use images (or anything at all) in an assignment that you did not create, you need to indicate as much. Just because a picture or data visualization is open source does not mean that you can pass it off as your own work. And if you don't cite it, plagiarism is exactly what you are doing—whether or not that was your intention.

Many problems in documenting sources occur because the writer is missing the point of source use. Remember, you must clearly distinguish between your ideas and borrowed material, and you must use borrowed material primarily as evidence for your own directly stated ideas.

Intellectual Property

Patents and trademarks are company names (Walmart), logos (the Target bullseye), processes or slogans (McDonalds "I'm lovin' it") that belong to a person or company. None of these things can be used without proper recognition of or approval from the appropriate company or individual involved. A company uses a ™ to show something is trademarked or an ® for something registered with the U.S Patent and Trademark Office. An example would be Nike and their famous swoosh symbol.

This law extends beyond the major companies. Any written document in your own company is copyrighted by law once produced. That means if you are borrowing a good idea from a friend at another company, you must cite them as a source. Also, although not required by law, it is a good idea to cite sources from inside your own company as well. You would not want someone else taking credit for your ideas. Why should you treat others any differently?

The legal consequences are most notable when one considers writing in the professional world. While plagiarizing in the classroom may give you a failing grade, plagiarizing in the workplace can get you fired and could result in a costly lawsuit or possibly even jail time. It is not only ethical to follow these rules, it is an enforced law. Make sure you properly document all sources so as not to mislead a reader.

Copyright law includes items whose distribution is protected by law (books, movies, or software). The copyright symbol is shown with a ©. Copyright is different from plagiarism in that it is a legal issue. Only the copyright holder, the person/organization who owns the protected item, can copy it. Spend a few minutes checking out The United States Patent and Trademark Office for clarification on trademarks, patents, and copyright.

When determining if a copyright law has been violated, the court makes certain considerations:

- The character, purpose of use, and amount of information being used. Was it a phrase, sentence, chapter, or an entire piece of work? Was the information simply copied and pasted as a whole or changed? Was it taken from something published or unpublished? What was it used for?
- If the person using another's material did so to profit from it. Only the copyright holders should profit from material they own. For example, a faculty member cannot use their personal DVD for a movie screening on campus and charge students to attend the viewing.
- If using someone else's property affected the market for the copyrighted work. For example, if you take an item that would cost money to buy and copy it for other people, you are affecting the market for that product since the people you give it to will now not have to purchase it themselves. Therefore, the original owner of the material is denied a profit due to your actions.

When dealing with copyright questions, consider the following tips:

- First, find out if the item can be used. Sometimes, the copyright holder allows it if credit is given.
- Second, do not use large amounts of another person's information.
- Third, if possible, ask permission to use another person's work.
- Finally, and most importantly, cite sources accurately so as to give credit to another person's ideas if you are able to use them.

Ethics, Plagiarism, and Reliable Sources

Unlike personal or academic writing, technical and professional writing can be used to evaluate your job performance and can have implications that a writer may or may not have considered. Whether you are writing for colleagues within your workplace or outside vendors or customers, you will want to build a solid, well-earned, favorable reputation for yourself with your writing. Your goal is to maintain and enhance your credibility, and that of your organization, at all times.

Credibility can be established through many means: using appropriate professional language, citing highly respected sources, providing reliable evidence, and using sound logic. Make sure as you start your research that you always question the credibility of the information you find. You should ask yourself the following questions:

- Are the sources popular or scholarly?
- Are they peer reviewed by experts in the field?
- Can the information be verified by other sources?
- Are the methods and arguments based on solid reasoning and sound evidence?
- Is the author identifiable, and do they have appropriate credentials?

Be cautious about using sources that are not reviewed by peers or an editor, or in which the information cannot be verified or seems misleading, biased, or even false. Be a wise information consumer in your own reading and research in order to build your reputation as an honest, ethical writer.

Quoting the work of others in your writing is fine—provided that you credit the source fully enough that your readers can find it on their own. If you fail to take careful notes, or the words/ideas are present in your writing without accurate attribution, it can have a negative impact on you and your organization. When you find an element you would like to incorporate in your document, the same moment as you copy and paste or make a note of it in your research file, note the source in a complete enough form to find it again.

Giving credit where credit is due will build your credibility and enhance your document. Moreover, when your writing is authentically yours, your audience will catch your enthusiasm, and you will feel more confident in the material you produce. Just as you have a responsibility in business to be honest in selling your product or service and avoid cheating your customers, so you have a responsibility in business writing to be honest in presenting your idea, and the ideas of others, and to avoid deceiving your readers with plagiarized material.

Ethical Writing

Throughout your career, you will be required to create many documents. Some may be simple and straightforward and some may be difficult and involve questionable objectives. Overall, there are a few basic points to adhere to whenever you are writing a professional document: **do not mislead; do not manipulate; do not stereotype.**

Do Not Mislead

This has more than one meaning to the professional writer. The main point is clear. When writing persuasively, do not write something that can cause the reader to believe something that is not true. This can be done by lying, misrepresenting facts, or just "twisting" numbers to favor your opinion and objectives. Once you are on the job, you cannot leave out numbers that show you are behind or over-budget on a project no matter how well it may work once it is completed. Be cautious when using figures, charts, and tables by making sure they visually represent quantities with accuracy and honesty. While this may seem easy, when the pressure is on and there are deadlines to meet, taking shortcuts and stretching the truth become ever more tempting.

Do Not Manipulate

Do not persuade people to do what is not in their best interest. A good writer with bad motives can twist words to make something sound like it is beneficial to all parties. The audience may find out too late that what you wrote only benefited you and actually hurt them. Make sure all stakeholders are considered and cared for when writing a persuasive document. It is easy to get caught up in the facts and forget all the people involved. Their feelings and livelihood must be considered with every appropriate document you create.

Do Not Stereotype

Most stereotyping takes place subconsciously now since workplaces are careful to not openly discriminate. It is something we may not even be aware we are doing, so it is always a good idea to have a peer or coworker proofread your documents to make sure you have not included anything that may point to discriminatory assumptions.

The not-for-profit organization Project Implicit has been researching subconscious biases for years and has developed several, free online tests. The tests can help you unearth and understand your own proclivities and prejudices. Knowing your biases may help you begin to overcome them.

Attributions

PART VI

DATA VISUALIZATION

18.

REVIEW OF BEST PRACTICES IN DATA VISUALIZATION

by Katherine McGee

Introduction

Think of the maps you see produced by the television station or website from which you get your weather information. While the meteorologist explains that northern Florida has highs in the 70s, central Florida has highs in the 80s, and southern Florida has highs in the 90s, that information is accompanied by a map. That map may simply have numbers on it, but it also likely has color added to it, with yellow representing a certain range of temperatures, orange representing a warmer range of temperatures, and red representing even hotter temperatures. These colors provide the audience with an additional way of understanding weather patterns. It's not that we don't understand that the "110" hovering over Brownsville, Texas is extremely hot; the dark red color of that area simply reinforces the idea, making it easy for us to quickly absorb information without having to process the actual posted high temperatures.

Sometimes it is beneficial to add visuals into your technical writing, especially if there are a lot of numbers or other types of data involved. Data visualizations such as graphs, charts, tables, and maps organize and communicate information in a way that is accessible to multiple audiences. Depending on the type of visualization, the visualization can help the user look up specific values or identify patterns hidden within the data.

There are many different types of data visualizations that can be and are used, depending on the purpose of the writer and the needs of the audience. Maps can be used to show not only high and low temperatures but also to identify voting patterns or patterns of income across a country. Records of high and low temperatures for the past ten years, or how much people in different professions make annually, can be presented in tables. Tables can also be used to compare and contrast different products. Sales records may be tracked using a line graph in order to see the rise and fall of sales throughout a quarter or a year; these same records could be presented in a table if the purpose is to be able to look up how many of a particular type of item was sold in a given month, quarter, or year.

Sometimes, more complex visualizations are necessary in order to identify the patterns hidden within the information. Consider, for instance, some of the patterns that David McCandless identifies in the visualizations he presents in this TED Talk video, or McCandless' visual depiction of 20th Century Death, where he breaks down the number of deaths according to categories, such as Humanity, and subcategories, such as War, Drugs, and Air Pollution. By breaking down causes of death in the 20th Century Death chart, McCandless enables readers to visualize the impact that diseases such as Smallpox, Tuberculosis, and Whooping Cough had during the 1900s, and compare them to other causes of death such as Road Traffic and Air crashes.

Purpose of Data Visualizations

According to Stephen Few, the purpose of data visualizations "is to communicate important information effectively" (9). As technical communicators, it is our job to use design in order to help our readers understand what the information says the numbers say (9). More specifically, the purposes of tables, graphs, and other types of data visualizations are to

- Clearly indicate how values relate to one another
- Represent quantities accurately
- Make it easy to compare quantities
- Make it easy to see ranked order of values
- Make obvious how people should use the information (Few, "Data Visualization for Human Perception")

An extensive description of every type of data visualization would be beyond the scope of the article; there are entire books written on this topic, and if you want to design in-depth, effective visuals, you should read more of Stephen Few's or Edward Tufte's works. The following are some descriptions of common genres and best practices for some of the types of visualizations you may use in your professional and technical communications classes and real world writing experiences.

Tables

Tables, "lists of data presented in a system of rows and columns" (Dobrin, et al), are useful if you want the reader to be able to look up specific values. Your professional and technical communications instructor, for instance, likely keeps some form of a gradebook such as depicted in Table 18.1:

Table 18.1

Student ID	Exam 1	Exam 2	Exam 3	Homework
12345	97	75	82	95
23456	79	79	81	90
34567	45	78	83	100
45678	99	98	100	100
56789	25	75	82	70

With a table, the data is organized in clearly defined rows and columns, and the instructor can easily look up the grade that each student received on an individual assignment.

Design Tips for Tables

You've probably seen a lot of tables in your lifetime, and some have probably been easier to read than others. The following are some guidelines for designing tables effectively:

Label each row and column clearly so that it is easy to look up values.

Use a legible font, and use that same font throughout the table (Few, Show, 177).

Avoid using too much ink. If you include solid lines between all items, the table can become more difficult to read (Few, Show, 160-61). See, for instance, Table 18.2, with the same information redesigned to have lines between each item. Notice that the table appears to be more cluttered than it did previously, even though it still has the same amount of information; this amount of clutter will increase if the table has more items. If necessary, light fill colors (Few, Show, 163) such as those used in Table 18.1 can be used to allow the reader to scan across lines more effectively.

Table 18.2

Student ID	Exam 1	Exam 2	Exam 3	Homework
12345	97	75	82	95
23456	79	79	81	90
34567	45	78	83	100
45678	99	98	100	100
56789	25	75	82	70

Graphs and Charts

Graphs and charts are useful when the patterns within the data tell a story. While the information was relatively easy to understand already, we'll use the information from Table 18.1 as an example. By transferring the numbers for the students' exam scores into Figure 18.3, it is easy to identify that Student 12345 did better on Exam 1 than he or she did on Exam 2. Students 34567 and 56789, on the other hand, performed much better on Exams 2 and 3 than they did on Exam 1. Students 23456 and 45678, however, performed at approximately the same standard on each exam that they took. These patterns of scores can tell the instructor several pieces of information: those students who performed consistently likely studied equal amounts for each test, while those who performed better on Exams 2 and 3 than on Exam 1 probably did not study effectively or were having a bad test day for Exam 1.

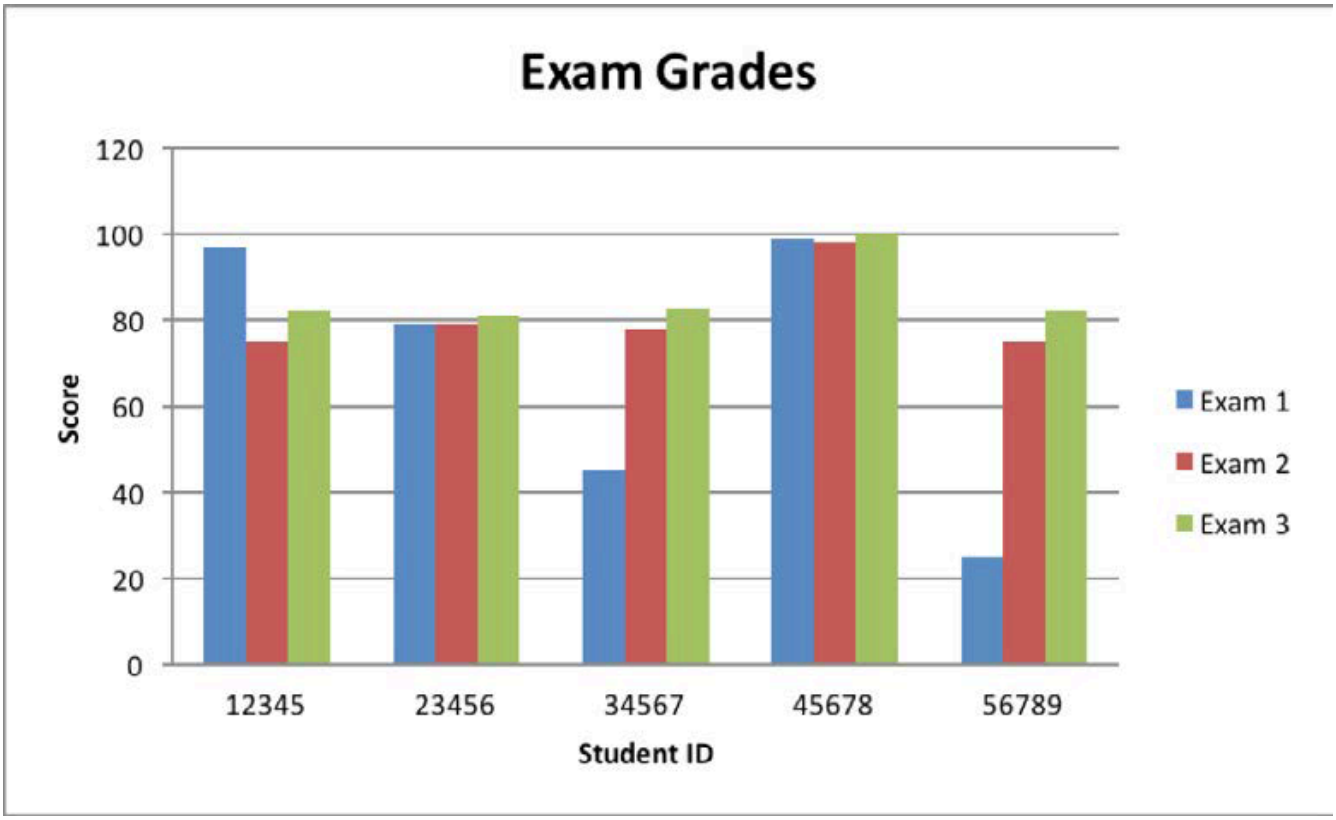

Figure 18.3

As data visualization designers, you are certainly not limited to bar graphs. On the contrary, there are numerous types of graphs and charts that you can use. While Figure 18.3 was created with Microsoft Word software, there are many alternative software available, including several free resources online.

See the list of Additional Sources at the end of this section for some examples of these resources.

Design Tips for Graphs and Charts

Label your axes clearly. If an axis contains quantitative information (numbers that have meaning) and shows only positive numbers, then the axis should begin at 0. In some rare cases, it is acceptable to use a different starting point, but if you are starting with a number other than 0, make sure that you mark that clearly. Some designers use varying axes to distort information, which is unethical.

Make sure that the spacing is even down columns and across rows. Numerical increments should also be equal down columns and across rows. Using unequal increments is another way to distort information

General Design Tips

When designing tables, graphs, and charts, it is necessary to remember general design tips as well. For starters, let's consider the CRAP (Contrast, Repetition, Alignment, and Proximity) principles of design, which Robin Williams explains in detail in *The Non-Designers' Design Book*.

Contrast

When we write essays in Microsoft Word, the default colors are black letters on a white background. The stark contrast between white and black make the words easier to read. Consider, however, how difficult it would be to read yellow font on a white background or red font on a maroon background. It's more difficult to read those words; we have to pause or squint in order to read them—if we can read them at all.

When we design data visualizations, we sometimes have to use color to show different categories or to make the image more visually appealing; we don't want to be limited to black lettering with a white background. We do, however, need to maintain that level of contrast with the images we design. Look back at Figure 18.3; notice that the graph uses blue, red, and green for the bars. These colors differ from each other enough that we can see where one bar ends and the next begins without having to pause or squint. If, however, the bars were all various shades of blue, the data would be more difficult to read. Figure 18.4 demonstrates this lack of contrast. While the graph is still readable because it has relatively few items, Figure 18.3 is easier to read quickly.

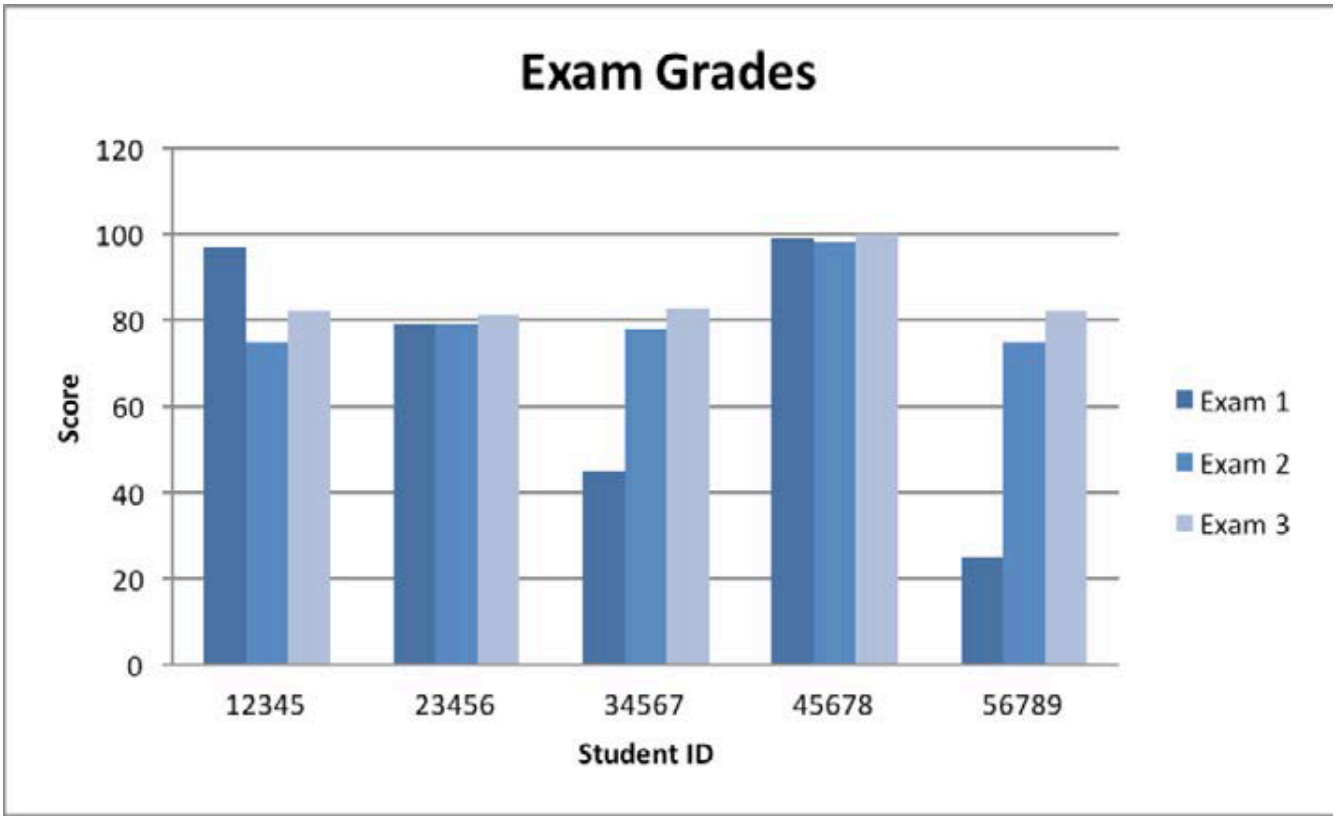

Figure 18.4

Repetition

Repeating ideas and colors provides cohesion. Consider the headings and subheadings you see throughout this textbook. Each article heading is written with the same font type, size, and color. This repeated design allows our brains to understand, each time we see that design, that we are looking at a new article within the same textbook.

To apply the principle of repetition to data visualizations, consider Figure 18.3 once again. Exam 1 is identified with blue ink for each student, Exam 2 is identified with red ink, and Exam 3 is identified with green ink. The repeated color scheme allows us to quickly associate the exam number and compare that exam across the students. The principle of repetition is especially important if you have multiple visualizations throughout your document.

If, for instance, you have three tables in a proposal, you want to demonstrate a sense of cohesion among the tables by using the same font, colors, line width, etc.

Alignment

It is essential to align texts and graphics in a readable manner. Think about the ways in which books and newspapers in the United States are formatted. Generally, text is left aligned or justified; depending on the genre, the beginning of each paragraph may be indented. Because we read from

left to right, and our brains are accustomed to seeing text aligned that way, you will rarely see large amounts of text that are right aligned. For a more in-depth discussion of alignment, look at Clayton Benjamin's article "Formatting Pages."

Alignment is perhaps most essential when dealing with tables, especially if you eliminate or reduce the amount of lines you use. In fact, proper use of alignment can save you the ink of having a lot of dividing lines. Align quantitative numbers to the right, thus allowing the ones, tens, etc. digits to align. If numbers are present in non-quantitative forms (e.g. the Student IDs in Tables 18.1 and 18.2), they can be left aligned. Most other information should be left aligned (Few, Show, 171).

Proximity

When two images or pieces of information are placed close to each other, we assume them to be connected in some way. If two images or pieces of information are placed further away from each other, we assume that they are not related or are not closely related. For instance, consider the subheading "Proximity." There is a space between the last Alignment paragraph and the word Proximity while there is not a space between Proximity and this paragraph. Thus, before we even read the content of the paragraphs, we know that this paragraph belongs with the subheading "Proximity" and not "Alignment," or another section. When designing tables, charts, and graphs, it is necessary to place related information close together. For instance, labels for parts of a graph (e.g. the Student IDs numbers in Figures 18.3 and 18.4) are placed as close as possible to that particular student's scores.

Problematic Chart Practices

One type of chart that is particularly popular is the pie chart. While some use them often because they allow the audience to see a basic part-to-whole relationship, they are also often criticized. Few, for instance, indicates that pie charts are ineffective because "[they] [encode] values as visual attributes . . . that we cannot easily perceive and compare" ("Data Visualization"). In other words, a quick glance at a pie chart informs us of general ratios, but it is often difficult to see the difference between amounts. For instance, if one section represents 20% and another represents 23%, the average human eye cannot discern the difference.

Another issue to be aware of is the use of 3D, which many also consider ineffective because the effect renders the information difficult to read accurately. Few indicates that 3D "cannot be applied effectively to graphs on a flat surface (e.g., a page or computer screen), which relies on illusory cues of light and shadow, occlusion, and size to simulate depth. Even if 3-D position could be used effectively on a flat surface, it is not an effective attribute to use in table and graph design because our perception of depth is weak compared to our perception of height and width" (Show 71).

How Should We Refer to The Visualizations?

Notice how the tables and graphs were discussed in this article. In order to effectively communicate the information in data visualizations, you need to label the visualizations properly, refer to them in the body of the text, and place them as close as possible to the relevant text. In a sentence or two (or maybe even a paragraph, if necessary) identify the most crucial piece of information you want your audience

to get from your visualization. Remember that part of the reason you're including these visualizations is to reach a wider audience. By pointing out the most relevant information in the text, you can more effectively reach various types of learners.

Attributions

Dobrin, S. I., Keller, C. J., & Weisser, C. R. (2008). Technical communication in the twenty-first century. Upper Saddle River, NJ: Pearson Prentice Hall. Few, S. (2012).

Show me the numbers: Designing tables and graphs to enlighten. (2nd ed.). Burlingame, CA: Analytics Press.

"Data Visualization for Human Perception" by Stephen Few. In: Soegaard, Mads and Dam, Rikke Friis (eds.). "The Encyclopedia of Human-Computer Interaction, 2nd Ed.". Aarhus, Denmark: The Interaction Design Foundation. Available online at

https://www.interactiondesign.org/encyclopedia/data_visualization_for_human_perception.html

Additional Resources

The following resources help you to create charts and graphs:

- Online ChartTool
- Chartgo: The simple chart maker
- Tech & Learning's list of top 10 chart-making sites

PART VII

WRITING FOR STEM AUDIENCES

19.

AUDIENCE

by Staci Bettes

Introduction

A key concern of technical communication is the receiver of the information—the audience. Technical communication is the delivery of technical information to readers (or listeners or viewers) in a manner that is adapted to their needs, level of understanding, and background. Your documents must clearly convey new information to the reader, and you often need to translate highly technical concepts to groups with differing levels of technical knowledge—this is a key skill for any technical communicator. Therefore, the audience is one of the most important considerations in planning, writing, and reviewing a document. Adapt your writing to meet the needs, interests, culture, and background of those who will be reading your documents.

It is often not enough to identify a single audience for documents. There are several types of readers who may use them, each with different backgrounds, education levels, needs, and interest in the topic. All should be considered when analyzing the audience for a successful technical document.

Types of Audiences

During the planning stages of your document, you should analyze the audience to identify the type (or types—it is rarely just one type) of reader. Identifying what type of reader may be interested in your document will help you create an improved, more effective document.

Common Types of Audiences

The following are several types of common audiences for technical documents:

- **Experts:** People who know the business or organization (and possibly the theory and the product) inside and out. They designed it, they tested it, and they know everything about it. Often, they have advanced degrees and operate in academic settings or in research and development areas of the government and technology worlds (the creators, specialists).
- **Technicians:** People who build, operate, maintain, and repair the items that the experts

design and theorize. They have highly technical knowledge as well, but of a more practical nature (the hands-on users, operators).

- **Executives:** People who make business, economic, administrative, legal, governmental, or political decisions about the products. Executives frequently have little technical knowledge about the subject. Often, executives will be the primary audience for documents such as proposals and reports (the CEOs, committees, hiring managers).
- **Gatekeepers:** People who oversee the writer and the document. They decide if the document is compliant with rules, regulations, legal obligations, and/or the needs of the writer's employer. Think of them as the direct supervisors of the writer—they confirm that a document will fulfill its purpose for the client, as well as ensure compliance with the company's rules, regulations, and policies. In the classroom, your instructor will often be your gatekeeper—they ensure you follow the standards and goals of the assignment (the writer's supervisors, lawyers, instructors).
- **Non-specialists:** People with the least technical knowledge of the topic. They want to use the new product to accomplish tasks; they want to understand the new technology, products, or procedures enough to use them in a particular situation. Or, they may just be curious about a specific technical matter and want to learn about it—but for no specific, practical reason (the laypeople).

Audience analysis can become complicated when you consider that you may have a combination of audience types and backgrounds: mixed audience types, wide variability within audience, and/or unknown audiences.

Multiple or Mixed Audiences

Most documents you write will have multiple or mixed audiences. Often, it is best to think of these in terms of the *primary audience*(s) and *secondary audience*(s).

The ***primary audience*** is the main reader of the document. For example, if you create a set of safety protocols to be displayed in a laboratory, the primary audience will be the technicians which use the laboratory. In this example, it is important to adapt the safety protocols for the technicians to understand, as unclear steps could lead to physical harm.

The ***secondary audience*** is made up of others who may read or be interested in a document, but who is not the main (primary) reader. In the laboratory example, these groups could be experts who enforce laboratory regulations and safety standards, but also could be non-specialist custodial staff that clean and maintain the lab. Both of these groups may be interested in this document—the experts ensure that safety standards are met, while the non-specialists may need to follow the displayed protocols in an emergency. Additionally, the secondary audience may be someone your primary reader consults if your message, report, proposal, etc. is a request for a specific action. For example, if you are a salesperson making a pitch to a client, that client may need to consult their supervisor before agreeing to your terms.

How should you approach writing a document with so many possible readers? First, *identify the primary audience* of your document. Then, *identify likely secondary audiences*, if any.

Most of the time, you will know who the primary audience is—you will be writing a document aimed at a particular group of people or a single person. You may have a client you are writing for or a group you specifically want to understand your ideas. In this case, you should write your document for the primary audience, but also include information for the secondary audiences. For example, if you write a set of new procedures for a company's technicians, you must also include information that your gatekeepers insist accompany the document such as legal clauses or business descriptions. You will also need to think about the technicians' bosses (executives) who need to approve any new procedures implemented at the site.

If you believe a document is unlikely to be used by the secondary audience(s), you can write for the primary audience only. This would be applicable if you create a set of instructions over "How to Change a Tire" for a website. You can assume most readers will be non-specialists who need assistance with the task, not mechanics, designers, or engineers in the automotive industry.

If you believe the document will likely be used by multiple audiences or you are unsure who the primary audience is, you can then write the document so that all the audiences can understand it. This is also a good choice if you know that many different types of readers will be interested. For example, imagine you wrote a research report over the use of a city's public park facilities. Community members (non-specialists) are just as likely to read the report as those on the city council (executives), the head of the Parks Department (experts), and those who maintain the parks (technicians). In this case, you would want to write your report to be accessible to all these types of audience.

Audience Analysis

Once you have identified the types of readers for a specific document, it is important to determine some of the qualities of these groups. If you are writing to a known, specific audience (e.g., Hiring Manager Serena Tims; Director of University Dining Services Ollie Lopez; the corporate board at Sony Inc.; etc.) versus a general, unknown audience (e.g., people who want to learn how to change their car's oil) you may need to do some research on the individual (if available), the company or organization they work for, or even the industry your audience is a player in. Determining these characteristics will help guide your document creation—you can decide what information needs to be included or eliminated, which terms to use or which need to be defined, an effective design for the document, and so on. Regardless of which type of reader you identify (experts, technicians, executives, gatekeepers, or non-specialists), you should analyze these groups in terms of their characteristics:

- **Background—Knowledge, Experience, and Training:** One of your most important concerns is just how much knowledge, experience, or training you can expect in your readers. If you expect some of your readers to lack certain background, do you automatically supply it in your document? Imagine you are writing a guide to using a software product that runs under Microsoft Windows. How much can you expect your readers to know about Windows? If some are likely to know very little about Windows, should you provide that information? If you say no, then you run the risk of customers getting frustrated with your product. If you

say yes, you increase your work effort and add to the document's page count (and thus the cost) and could annoy users with more knowledge. Obviously, there is no easy answer to this question—part of the answer may involve just how small a segment of the audience needs that background information.

- **Needs and Interests:** To plan your document, you need to know what your audience is going to expect from that document. Imagine how readers will want to use your document. What will they demand from it? For example, imagine you are writing a manual on how to use a new smartphone—what are your readers going to expect to find in it? Do they want to quickly find answers to specific user questions, or do they expect a comprehensive breakdown of each phone function? Make decisions on what readers want to read about as well as what they do not want to read about.
- **Culture and Values:** The difference between *culture* and *values* can be difficult to define, but both influence how an audience approaches new ideas.

Culture consists of the shared beliefs, attitudes, behaviors, values, and assumptions shared by an identified group of people. It is what sets a group apart from others. *Values* are the deeply held principles that guide thoughts and actions. Think of *culture* as the social dynamic that sets the tone, and *values* as the by-products of the culture that affect decisions.

When analyzing the reader's culture, remember these five things:

- **It Is Learned:** The conscious and unconscious learning we undergo, over time, turns into beliefs that we consider to be valid. We then teach each other that these beliefs are cultural norms. They are expressed in our daily lives as behaviors and actions.
- **It Is Shared:** Although you may think of yourself as an individual, you share beliefs, rituals, ceremonies, traditions, and assumptions with people who grew up or live in similar cultural backgrounds.
- **It Is Dynamic:** Culture is dynamic and complex. Culture is fluid rather than static, which means that culture changes every day, in subtle and tangible ways. It is important to pay attention to the cultural context of a communication to understand the depths of its dynamic properties.
- **It Is Systemic:** There are patterns of behavior and deeply rooted structural systems which are beneath the waterline. What we see at the top of the iceberg are the behaviors; we do not see what contributes to those behaviors. Changes to the system are slow and gradual; visible changes may not appear until later.
- **It Is Symbolic:** Symbols are both verbal and nonverbal in form within cultural systems, and they have a unique way of linking human beings to each other. Humans create meaning between symbols and what they represent; as a result, different interpretations of a symbol can occur in different cultural contexts.

There are two levels of culture and values you should consider: *personal* and *corporate*. *Personal culture* may be created by shared religion, race, ethnicity, region, and/or social groups. A classic example is the culture within a religious group—this can lead to specific types of dress, language, and celebrations. *Personal values* are the beliefs held by the individual, but they are influenced by culture as well as other factors.

Corporate culture and values are similar, but on a micro level. *Corporate culture* is created by the employees and how they interact. Within a company, different departments may have their own cultures, in addition to the company's collective culture. *Corporate values* are set by the company and are often reflected in their mission statements, policies, and other structures. These are the principles that guide the company's decisions and goals. When considering culture and values, identify both personal and corporate factors that can influence the reader.

Other Demographic Characteristics: Of course there are many other characteristics about your readers that might influence how you should design and write your document—for example, age groups, type of residence, area of residence, gender, political preferences, and so on. For example, if you write a proposal to raise gas taxes by $.01 to fund speedbumps in neighborhood streets, you will need to consider the neighborhood's habits (do most residents drive, walk, or take public transportation?), the age of resident (older residents are often on a fixed budget; younger residents may think speedbumps are a nonissue), political preference (some could be against infrastructure spending), and other qualities.

Wide Variability in an Audience

You may realize that, although you have an audience that fits into only one category, its background varies widely. If you write to the lowest common denominator of reader, you are likely to end up with a cumbersome, tedious, book-like report that will turn off the majority of readers. However, if you do not write to that lowest level, you lose that segment of readers. In this situation, most writers compose for the majority of readers and sacrifice the minority readers. Others put the supplemental information in appendixes or insert cross-references to beginners' books.

Adapt Your Writing to Meet Your Audience's Needs

Once you have identified and analyzed your audience, how do you use this information? How do you keep from writing something that may potentially still be incomprehensible or useless to your readers? Draft your document with your audience's needs in mind, but remember that writing can be refined over many drafts. With each subsequent draft, think more carefully about your readers, and revise and edit your document so that you make technical information more understandable for specific audiences.

The following list contains some strategies to help you make technical information more understandable for differing audiences. You can use these strategies to revise and refine as you begin to put your final document together. However, it is a good idea to be aware of your audience's needs even in the early stages of your report drafting.

Content

- Add information readers need to understand your document.
- Omit unnecessary information.
- Change the technical level of the information.
- Add examples to help readers understand.

Style and Format

- Change the organization of your information.
- Strengthen transitions.
- Write stronger introductions—both for the whole document and for major sections.
- Create topic sentences for paragraphs and paragraph groups.

Sentence Style

- Change sentence style and length.
- Edit for sentence clarity and economy.

Document Design

- Add and vary graphics.
- Break text up or consolidate text into meaningful, usable chunks.
- Add cross-references to important information.
- Use headings and lists.
- Use special typography, and work with margins, line length, line spacing, type size, and type style.

Strategies to Revise Content

- Add information readers need to understand your document. Check to see whether certain key information is missing—for example, a critical series of steps from a set of instructions; important background that helps beginners understand the main discussion; definition of key terms. Note that some of this information can be added in the main document body, but you can also add appendices or glossaries—it depends on your audience and document type.
- Omit unnecessary information. Unnecessary information can also confuse and frustrate readers—after all, it is there so they may feel obligated to read it. Technical documents are often skimmed for important detail—excess unnecessary information could make the reader miss important information. For example, you can probably chop theoretical discussion from basic instructions.
- Change the technical level of the information. You may have the right information in your

document, but it may be pitched at too high or too low a technical level. Are you using terms the reader will be familiar with? Is the sentence structure clear for the audience's reading comprehension? It may be pitched at the wrong kind of audience—for example, an expert audience rather than a technician audience. This happens often when product-design notes are passed off as instructions. Think about your audience's education level and familiarity with the topic and terms used, and revise to make sure your content is clear for that audience.

- Add examples to help readers understand. Examples are one of the most powerful ways to connect with audiences, particularly in instructions. Even in a non-instructional text, when you are trying to explain a technical concept, examples are helpful—analogies in particular. If you already have examples, it may help to alter the technical content or level of your examples. Common examples may not be useful to experts; highly technical ones may totally miss your non-specialist readers.

Strategies to Revise Style and Format

- Change the organization of your information. Sometimes, you can have all the right information but arrange it in the wrong way. For example, there can be too much background information up front (or too little) such that certain readers get lost. Other times, background information needs to be placed throughout the main text—for example, in instructions it is sometimes better to feed in chunks of background at the points where they are immediately needed. If the document does not seem to work for the audience, try reorganizing some of the information so that the document is clearer and easier to understand.
- Strengthen transitions and key words. It may be difficult for readers, particularly non-specialists, to see the connections between the main sections of your report, between individual paragraphs and sometimes even between individual sentences. You can make these connections much clearer by adding transition words and by echoing key words more accurately. Words like "therefore," "for example," "however" are transition words—they indicate the logic connecting the previous thought to the upcoming thought. You can also strengthen transitions by carefully echoing the same key words. A report describing new software for architects might use the word software several times on the same page or even in the same paragraph. In technical documents, it is not a good idea to vary word choice—use the same words so that people can clearly understand your ideas. Your design choices can also visually connect and transition between sections (see the "Strategies to Revise Document Design" below).
- Write stronger introductions—for the whole document and for major sections. People seem to read with more confidence and understanding when they have the big picture—a view of what is coming, and how it relates to what they have just read. Therefore, writing a strong introduction to the entire document—one that makes clear the topic, purpose, audience, and contents of that document—makes the document easier to understand. In most types of technical documents, each major section includes mini-introductions that indicate the topic of the section and give an overview of the subtopics to be covered in that section to let the

reader know what information each section will contain.

- Create topic sentences for paragraphs and paragraph groups. It can help readers immensely to give them an idea of the topic and purpose of a section (a group of paragraphs) and in particular to give them an overview of the subtopics about to be covered. This is the first sentence of the paragraph and states the main point or idea. The type of topic sentence can vary depending on document type. In an argumentative paragraph, you will make a claim which you will prove through the rest of the paragraph (e.g., reports; proposals; some emails, letters, and memos). In informative documents, the topic sentence will be an overall point which you will explain and back up in the detail sentences (e.g., informative emails, letters, and memos; results section of a report).

Strategies to Revise Sentence Style

- Change sentence style. How you write—at the individual sentence level—can make a difference to the effectiveness of your document. In instructions, for example, using imperative voice and "you" phrasing is vastly more understandable than the passive voice or third-personal phrasing.
- *Passive voice* is where one switches the location of the subject and object in a sentence. A simple, active sentence such as "The boy threw the ball" becomes the wordy, passive sentence "The ball was thrown by the boy." Taking the emphasis off the noun—in this case, *the boy*—and the action—*throw* vs *was thrown*—detracts from meaning of the sentence. Passive, person-less writing is harder to read—put people and action in your writing. There are times to write in passive voice, but technical documents generally need active sentence structure.
- Revise to use more active verbs, and less "be verb" phrasing. All of this makes your writing more direct and immediate. Also, personalizing your writing style and making it more relaxed and informal can make it more accessible.
- Edit for sentence clarity and economy. This is closely related to the previous strategy. Writing style can be so wordy that it is hard or frustrating to read. Sentence length matters. An average of somewhere between 15 and 25 words per sentence is about right; sentences over 30 words are often mistrusted. When you revise your rough drafts, put them on a diet—go through a draft line by line trying to reduce the overall word, page, or line count by 20 percent. Try it as an experiment and see how you do. You will find a lot of fussy, unnecessary detail and inflated phrasing you can chop out. Eliminate excess words and phrases; state ideas as simply as possible while still providing necessary detail.

Strategies to Revise Document Design

- Add and vary graphics. For non-specialist audiences, you may want to use more, simpler graphics. Graphics for specialists are often more detailed and technical. In technical documents for non-specialists, there also tend to be more "decorative" graphics—ones that are attractive but serve no strict informative or persuasive purpose at all.
- Break text up or consolidate text into meaningful, usable chunks. For non-specialist readers,

you may need to have shorter paragraphs. A six to eight-line paragraph is the usual maximum. This is because a paragraph should contain content about a single idea; breaking up paragraphs into smaller ideas can help the reader more easily understand the individual topics, while also making the text less (visually) overwhelming. Notice how much longer paragraphs are in technical documents written for specialists—the ideas do not need to be broken down as much visually for a specialist to understand the content.

- Add cross-references to important information. In technical information, you can help readers by pointing them to background sources. If you cannot fully explain a topic at a certain time in a document, point to a section, chapter, or external source where the information is located. One can also include glossary of terms or appendices at the end of a document with extra information that is related, but not 100% necessary, to understand the document's content.
- Use headings and lists. Readers can be intimidated by dense paragraphs and "walls of text" uncut by anything other than a blank line now and then. Search your rough drafts for ways to incorporate headings—look for changes in topic or subtopic. Search your paragraphs for listings of items—these can be made into vertical lists or look for paired listings such as terms and their definitions—these can be made into two-column lists. Of course, be careful not to force this type of formatting, and do not overdo it.
- Use special typography, and work with margins, line length, line spacing, type size, and type style. Depending on your audience, you can modify the format by making the lines shorter or longer (adjusting margins), using larger or smaller type sizes, and other such tactics. Typically, sans-serif fonts, such as Ariel, are useful for online readers. Serif fonts, such as Time New Roman, are useful for print texts. (See chapter 5 for more information about document design)

By now you should be able to see that many of the decisions you make as a writer depend on who will read your report. From content, to language, to layout, every aspect of your communication must keep your readers' needs in mind.

We will spend time later in this book expanding our discussion of audience as well as document design—an important consideration that can help tremendously in making your document professional and easy to read.

Attributions

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20.

STAKEHOLDER ENGAGEMENT AND CONSULTATION

by Suzan Last

Stakeholder Engagement and Consultation

One important area of primary research undertaken when embarking on any large-scale project entails "public engagement," or stakeholder consultation. Public engagement is the broadest term used to describe the increasingly necessary process that companies, organizations, and governments must undertake to achieve a "social license to operate." Stakeholder engagement can range from simply informing the public about plans for a project, to engaging in more consultative practices like getting input and feedback from various groups, and even to empowering key community stakeholders in the final decision-making process.

For projects that have social, economic, and environmental impacts, stakeholder consultation is an increasingly critical part of the planning stage. Creating an understanding of how projects will affect a wide variety of stakeholders is beneficial for both the company instigating the project and the people who will be affected by it. Listening to stakeholder feedback and concerns can be helpful in identifying and mitigating risks that could otherwise slow down or even derail a project. For stakeholders, the consultation process creates an opportunity to be informed, as well as to inform the company about local contexts that may not be obvious, to raise issues and concerns, and to help shape the objectives and outcomes of the project.

What Is a Stakeholder?

Stakeholders include any individual or group who may have a direct or indirect "stake" in the project—anyone who can be affected by it, or who can have an effect on the actions or decisions of the company, organization or government. They can also be people who are simply interested in the matter, but more often they are potential beneficiaries or risk-bearers. They can be internal—people from within the company or organization (owners, managers, employees, shareholders, volunteers,

interns, students, etc.)—and external, such as community members or groups, investors, suppliers, consumers, policy makers, etc. Increasingly, arguments are being made for considering non-human stakeholders such as the natural environment.[1]

Stakeholders can contribute significantly to the decision-making and problem-solving processes. People most affected by the problem and most directly impacted by its effects can help you to

- understand the context, issues and potential impacts more fully
- determine your focus, scope, and objectives for solutions
- establish whether further research is needed into the problem.

People who are attempting to solve the problem can help you

- refine, refocus, prioritize solution ideas
- define necessary steps to achieving them
- implement solutions, provide key data, resources, etc.

There are also people who could help solve the problem but lack awareness of the problem or their potential role. Consultation processes help create the awareness of the project to potentially get these people involved during the early stages of the project.

Stakeholder Mapping

The more a stakeholder group will be materially affected by the proposed project, the more important it is for them to be identified, properly informed, and encouraged to participate in the consultation process. It is therefore critical to determine who the various stakeholders are, as well as their level of interest in the project, the potential impact it will have on them, and power they have to shape the process and outcome. You might start by brainstorming or mind-mapping all the stakeholders you can think of. See **Figure 20.1** as an example.

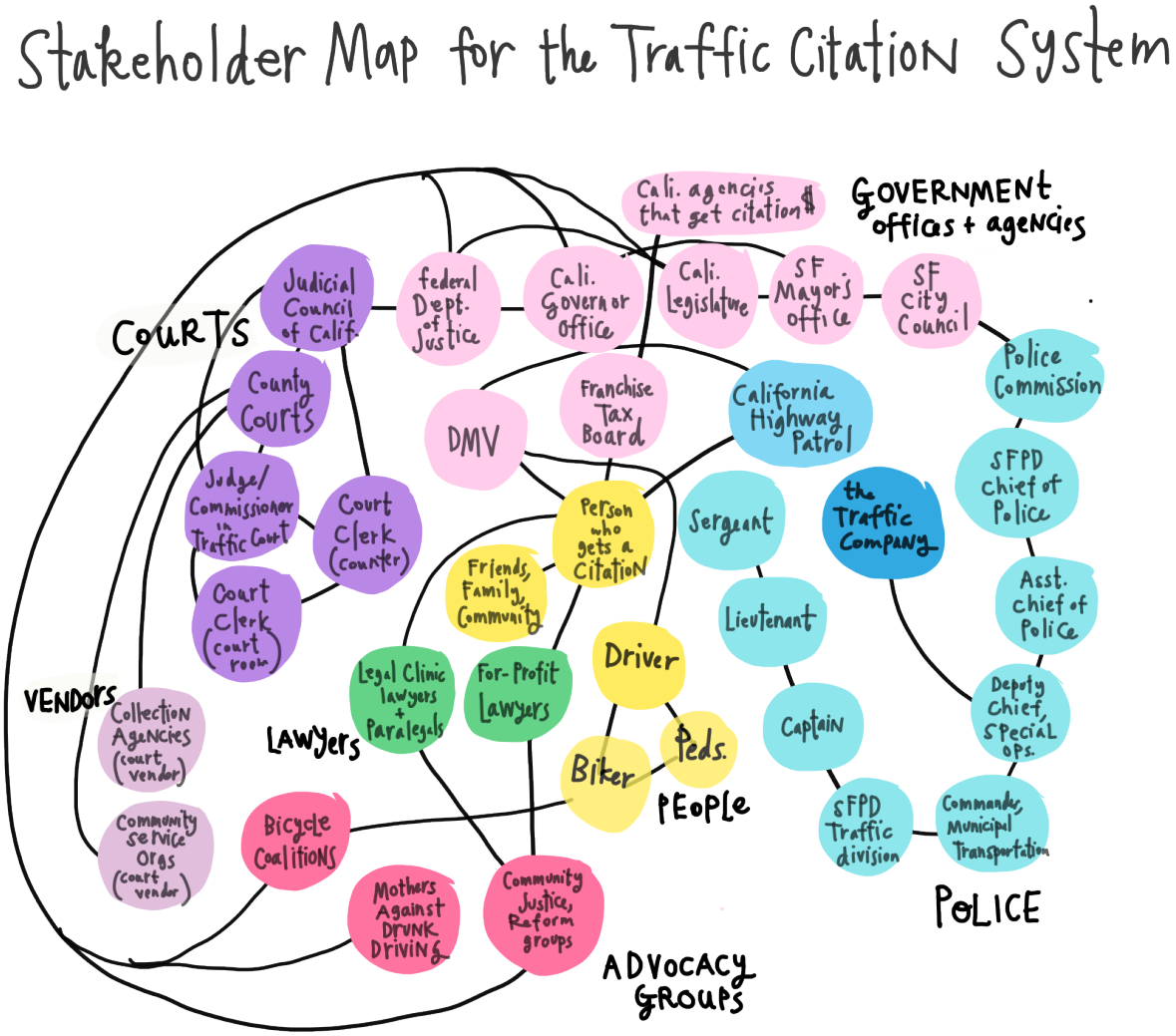

Figure 20.1

Once you have identified stakeholders who may be impacted, organize them into categories or a matrix. One standard method of organizing stakeholders is to determine which ones are likely to be in support of the project and which are likely to oppose it, and then determine how much power or influence each of those groups has (see **Figure 20.2**). For example, a mayor of a community has a strong level of influence. If the mayor is in full support of the project, this stakeholder would go in the top right corner of the matrix. Someone who is deeply opposed to the project, but has little influence or power, would go at the bottom left corner.

Level of Influence	Level of Support for the Project		
	In opposition ←	Somewhere in the middle/undecided	→ In full support
Strong →			
← Low			

Figure 20.2

A matrix like this can help you determine what level of engagement is warranted: where efforts to "consult and involve" might be most needed and most effective, or where more efforts to simply "inform" might be most useful. You might also consider the stakeholders' level of knowledge on the issue, level of commitment (whether in support or opposed), and resources available.

Levels of Stakeholder Engagement

There are various levels of engagement, ranging from simply informing people about what you plan to do, to actively seeking consent and placing the final decision in their hands. This range (presented in **Figure 20.3)** is typically presented as a "spectrum" or continuum of engagement from the least to most amount of engagement with stakeholders.

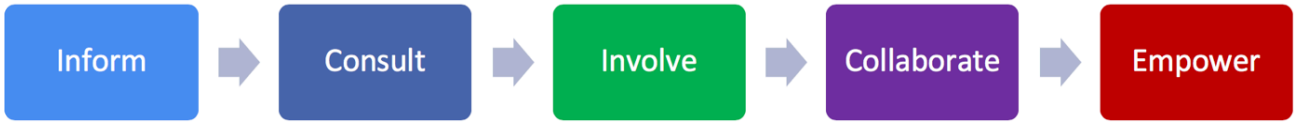

Figure 20.3

Depending on the type of project, the potential impacts and the types and needs of stakeholders, you may engage in a number of levels and strategies of engagement across this spectrum using a variety of different tools (see **Table 20.4**):

- **Inform:** Provide stakeholders with balanced and objective information to help them understand the project, the problem, and the solution alternatives. (There is no opportunity for stakeholder input or decision-making).
- **Consult:** Gather feedback on the information given. Level of input can range from minimal

interaction (online surveys, etc.) to extensive. Can be a one-time or ongoing/iterative opportunities to give feedback to be considered in the decision-making process)

- **Involve:** Work directly with stakeholders during the process to ensure that their concerns and desired outcomes are fully understood and taken into account at each stage. Final decisions are still made by the consulting organization, but with well-considered input from stakeholders.
- **Collaborate:** Partner with stakeholders at each stage of the decision-making process, including developing alternative solution ideas and choosing the preferred solution together. The goal is to achieve consensus regarding decisions.
- **Empower:** Place final decision-making power in the hands of stakeholders. Voting ballots and referenda are common examples. This level of stakeholder engagement is rare and usually includes a small number of people who represent important stakeholder groups.

Table 20.4 "Typical Tools for Public Engagement"

Inform	Consult	Involve / Collaborate / Empower
Public meetings		Consensus workshops
Briefings	Public meetings, hearings, workshops	Charrettes
News media	Focus groups	"World Cafes"
Public Presentations	Study circles	Study groups
Info Kiosks	Interviews	Focus groups
Hotlines	Surveys	Task Force
Newsletters	Opinion polls	Think Tanks
Bulletins	Questionnaires	Advisory boards, committees
Social media	Social Media	Citizen panels or juries
Websites	Suggestion boxes	Polling
Fact sheets	Comment forms	Votes, referenda
Arts and entertainment		Social media

Consultation Project Management Steps

There is no single "right" way of consulting with stakeholders. Each situation will be different, so each consultation process will be context-specific and will require a detailed plan. A poorly planned consultation process can backfire as it can lead to a lack of trust between stakeholders and the company. Therefore, it is critical that the process be carefully mapped out in advance, and that preliminary work is done to determine the needs and goals of the process and the stakeholders involved. In particular, make sure that whatever tools you choose to use are fully accessible to all the stakeholders you plan to consult; an online survey is not much use to a community that lacks robust Wi-Fi infrastructure. Consider the following steps:

1. **Situation Assessment**: *Who needs to be consulted about what and why*? Define internal and external stakeholders, determine their level of involvement, interest level, and potential impact, their needs and conditions for effective engagement.
2. **Goal-setting**: *What is your strategic purpose for consulting with stakeholders at this phase of the project?* Define clear understandable goals and objectives for the role of stakeholders in the decision-making process. Determine what questions, concerns, and goals the stakeholders will have and how these can be integrated into the process.
3. **Planning/Requirements**: Based on situation assessment and goals, determine what engagement strategies to use and how to implement them to best achieve these goals. Ensure that strategies consider issues of accessibility and inclusivity and consider vulnerable populations. Consider legal or regulatory requirements, policies, or conditions that need to be met. Determine how you will collect, record, track, analyze and disseminate the data.
4. **Process and Event Management**: Keep the planned activities moving forward and on track, and adjust strategies as needed. Keep track of documentation.
5. **Evaluation**: Design an evaluation metric to gauge the success of the engagement strategies; collect, analyze, and act on the data collected throughout the process. Determine how will you report the results of the engagement process back to the stakeholders.

Stakeholder Consultation: Communication Skills

Effective communication is the foundation of stakeholder consultation. The ability to create and distribute effective information, develop meaningful relationships, build trust, and listen to public input is essential. The basic communication skills required for any successful stakeholder engagement project include the following:

- **Effective Writing**: The ability to create clear and concise written messages in plain language.
- **Visual Rhetoric**: The ability to combine words and graphics to make complex issues understandable to a general audience.
- **Public Speaking/Presenting**: The ability to present information to large audiences in a comfortable and understandable way. The ability to create effective visual information that assists the audience's understanding.
- **Interpersonal and Intercultural Skills**: The ability to relate to people in face-to-face situations, to make them feel comfortable and secure, and to be mindful of cultural factors that may affect interest level, accessibility, impact, values, or opinions.
- **Active Listening**: The ability to focus on the speaker and portray the behaviors that provide them with the time and safety needed to be heard and understood. The ability to report back accurately and fully what you have heard from participants.

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Attribution

21.

WRITING FOR YOUR HEALTH SCIENCES AUDIENCES

by the Excelsior Online Writing Lab

When you begin a writing assignment in a Health Sciences course, you want to ask yourself some questions first:

- **Who is your audience?**
    - Another health professional? The general community? A government official?
- **What kind of tone is most appropriate based on your audience?**

Knowing the answers to these questions will help you decide what kind of voice you use, the kinds of technical terms you may include, and the structure your writing will follow. Thinking of who your audience is and what their expectations are will also help you decide what kind of introduction and conclusion to write.

For example, if you are writing for a colleague or another health sciences professional, your tone may be somewhat formal, and you will be free to use technical terms that are specific to your field. However, if you are writing a community blog post for the general public, you can use a more relaxed, even conversational tone, and you might want to avoid overly technical terms that not everyone understands. Knowing who your audience is will help guide you through the writing process.

As you write your piece, whether it is a case analysis, a letter to an elected official, community outreach, or a blog post, try to imagine what information your audience will need on your topic. You should also think about how your writing will sound to your audience and make sure you are writing in the appropriate voice. As always, your job as the writer is to communicate your thinking in a clear, thoughtful, and complete way.

Attribution

PART VIII

GENRE CONVENTIONS

22.

ARGUMENT AND DIGITAL WRITING

by the Excelsior Online Writing Lab

So, by now, you must feel like you're becoming an expert in all of this argument stuff, even though there is a lot take in. However, before you conclude any lessons in writing good arguments, it's important to think about the different forms arguments can take.

It's not all about the essays, and though they are likely to be an important part of most college classes, digital writing is likely to play a role as well. You may be asked to create an argumentative presentation to supplement your essay, or you may be asked to create a web page or photo essay instead.

When you enter the world of digital writing, the same rhetorical principals will apply: You have to think about your audience, purpose, and voice, and you have to consider your persuasiveness by thinking about how you will appeal to ethos, pathos, and logos. It's just the medium of presentation might be different.

The following pages will offer some important tips on creating arguments in digital environments and link you to some additional resources, which can be helpful as you work with the technology.

Argumentative Presentations

All good presentations have a clear purpose, and an argumentative presentation will have a **clear *argumentative* purpose**.

Many college students are required to build presentations to present information to an audience, and your writing class is likely no different. Chances are, you'll use **PowerPoint**, **Prezi**, or some other presentation software to build a presentation that would present your argument to a broader audience.

Before you begin to build your presentation, be sure to review the tips and help on creating effective PowerPoints and Prezis in the **Online Writing & Presentations** area of the Excelsior OWL. Then, remember the lessons you have learned about building a good argument and apply those to your presentation.

Here are some things to keep in mind:

- Remember to present your thesis statement or main idea clearly, and remember it should present your argument.
- Provide the highlights of your evidence from your essay (if you are building from an essay) or simply focus on the key points of evidence from your research.
- Remember to address the opposition. How you do this will depend upon your goals and the type of argument you are making, but you should always do it.
- Use images relevant to your points as evidence. Images are powerful and are important pieces of an effective presentation.
- Always cite your sources

The sample video linked below was created using Prezi by a student in a beginning writing class. She took an essay she had written on issues in the clothing industry (Cheap Thrills: The Price of Fast Fashion) and developed a Prezi to share with a broader audience. Click here to see how one student developed an argumentative presentation for her writing class.

Argument and the Web

Fortunately, there are plenty of free sites out there that offer free web space and easy-to-use programs. In fact, you can have your very own web page with just a little pointing and clicking.

Free and easy-to-use sites for creating web pages for your classes can be found at sites like **Wix**, **Weebly**, and even **Google Sites**. In fact, if you have a Gmail account, you have access to some free web space already.

The key is to remember you are bringing your argument to a different environment—the web, so you wouldn't just copy and paste your argumentative essay, plop it in the site, and call it good.

Tips

- **Reformat your paper to make it work for the web.** This means shorter paragraphs, no more MLA or APA headings, and a font that works well. Times New Roman may be required for your college essays but won't work well for the web.
- **Use images to bring your argument to life.** This could be pictures or graphics. If you get them from other sources, be sure you have permission or use images available for reuse. And, always cite them!
- Remember, **when you present your sources, link to them.** One great benefit of writing for the web is that you can make it so easy for your audience to find out more from your sources by linking directly to them.
- **Study other web pages** to get an idea about what works well and what will work well for your rhetorical situation.

Argument in Photo Essays

If you're building your first photo essay, get ready for an exciting challenge. A **photo essay** is essentially a story—or in this case, an argument—that is made through mainly images instead of text.

When you build an argumentative photo essay, just as with any other essay, you're going to think about what your main argument is and what kind of evidence you'll use to support your claims. In the case of a photo essay, your evidence comes through visually via pictures.

For example, let's say you want to create a photo essay about people who live with food insecurity in your area. You would want to take pictures of people who deal with food insecurity, perhaps take pictures of their pantries and refrigerators. These pictures could be extremely powerful and persuasive. The appeals to **pathos** would be strong and moving.

Of course, you should be sure to get permission before you take anyone's pictures, but photo essays can be a wonderful opportunity to express your creativity and make your argument in a powerful manner.

Sometimes, seeing an example is the best way to get started with a new project. The video below shows a sample student photo essay on the dangers of plastic. Notice the powerful argument the student is able to make by using images and very little text.

Argument in Video Essays

An argumentative video essay uses video to present an argument and can be very powerful. If you think about it, the documentaries you watch are actually really long, argumentative video essays.

Of course, the video essays you make do not have to be the length of a documentary and do not have to be as fancy. But creating a video essay can be an exciting endeavor and a great way to get your arguments and ideas to a wider audience.

In a video essay, you **use videos, images, text, and narration** to present your argument. For example, if you're creating an argument to call for changes to environmental policies in your area, instead of writing a traditional argumentative essay, it would be extremely powerful to create a video essay, which would allow you to use videos and images of the environments you hope to improve.

The **Online Writing & Presentations** area of the Excelsior OWL offers some helpful tips and software advice for creating a strong video essay. Remember, you must argue a point!

You can also check out this student's sample persuasive video essay created for her college application package.

Argumentative Portfolio Letters

If you're in a class that requires a writing portfolio, you'll likely be required to submit a reflective cover letter that introduces your work to your audience. In some cases, that audience is your professor, but in other cases, that audience is a committee of professors.

Many times, this reflective cover letter will have an argumentative angle to it. You may be working to make the case that your work shows you have met the requirements of a course or a program and are ready to move on to the next level in your writing.

Thinking about the lessons you have learned in this area of the Excelsior OWL can help you write that letter. If you're making an argument that your writing meets the requirements of a course or program, what examples and evidence can you provide to your audience? What examples or evidence should you provide? What tone will you take?

The following sample outline for a portfolio letter shows you how this type of writing is really persuasive and what kinds of things you might consider including in your own letter. Of course, this is just a sample outline, and different courses and programs will have different requirements. Still, if you approach your portfolio letter as a persuasive letter, you are likely to be more convincing to the portfolio scoring committee, or your professor, that you have met the requirements of the course and are ready to move forward with your writing.

- In your introduction, **provide the portfolio committee with a little background about yourself as a writer**. Don't tell your life story but describe some of your past experiences as a writer. Where were you starting from as a writer when you began this course?
- At the end of your introduction, **provide a thesis statement** that makes a clear assertion about your growth as a writer and what the portfolio committee can expect to see in your portfolio.
- In your body paragraphs, **spend some time discussing each piece of your portfolio**. Give specific examples of your work, your revision, and what you learned. Make sure you address the outcomes or goals of your course. How does your work reflect these outcomes being met? You may need several pages to make your case here. Be sure to review length requirements with your professor.
- In your conclusion, **explore your continued struggles as a writer,** acknowledge where you want to go, but remind the committee that you have grown and made improvements thanks to your work in the course.

Attributions

- Saavedra, S. (2010, April 18). *The Plastic Soup Photo Essay*. [Video]. YouTube. https://www.youtube.com/watch?v=SQh898IcOgM
- JrdJay. (2011, December 19). College Video Essay. [Video]. YouTube. https://www.youtube.com/watch?v=DJnf7zw_30QCV

23.

ANALYTICAL REPORTS

by Staci Bettes

Introduction

Analytical reports have specifications as do any other kind of project. Specifications for reports involve layout, organization and content, format of headings and lists, design of the graphics, and so on. The advantage of a required structure and format for reports is that you or anyone else can expect them to be designed in a familiar way—you know what to look for and where to look for it. Reports are usually read in a hurry. People want to get to the information they need—key facts, conclusions, and other essentials—as quickly as possible.

For example, you might find reading journal articles none too stimulating. Nevertheless, journal articles and reports are important and carefully crafted. The rigid format and objective style lend them a universal utility so readers from various disciplines can readily access and use the complex information. Your professors will confirm that busy academics rarely read reports and articles linearly—many readers cut right to Results and Discussion or look over the tables and figures before reading anything, then jump around to those bits of the report that are most relevant to their needs. Often, their goal is to rapidly exclude information they do not want or need.

The same can be said for any type of report. It is especially important for you to write reports in a fashion acceptable for your audience and topic, where they can easily locate the desired information. As you prepare technical reports for your classes, you have a built-in template in which to put your information, and you can plug in to a tried and proven template that has evolved over many years. Understanding and conforming to this template will help you to organize complex information as well as meet your reader's specific needs.

When you write technical reports, notice how repetitive some sections are. This duplication has to do with how people read reports. They may start with the executive summary, skip around, and probably not read every page. Your challenge is to design reports so that the readers encounter your key facts and conclusions, no matter how much of the report they read or in what order they read it.

Types of Reports

Reports are a common and important part of communication in the working world. They can update readers about progress on a project, inform of some activity, show research on an item, make recommendations to the reader, document a problem, request funding, or submit a call to action. These are only some examples of what a report can do. There are several types of reports you may encounter in your classes or in the workforce, including:

- **Scientific Reports**: record and explain information found through scientific inquiry; they propose a hypothesis that is often proved right or wrong.
- **Informational Reports**: carry information, such as finances, employee statistics, etc., from one part of the company to another.
- **Project-Completion Reports**: created at the end of a project to resolve an issue and are often used to evaluate the success of a project.
- **Research Reports**: condense and highlight research completed on a topic.
- **Recommendation Reports**: present research to recommend a specific action(s) to resolve a problem.
- **Feasibility Reports**: assess and discuss the viability of a specific action or change.

The purpose of all report types is the same—to clearly and accurately describe something that has happened or is happening.

Report Purpose and Audience

In a technical writing course, the report assignment serves several purposes: **a) it gives you some experience in writing a report; b) displays your research on a topic; and c) shows how you came to your conclusions on that topic.** The report is often the conclusion of a weeks-long research and writing process that goes through many stages until it gets to the end point.

Another point to keep in mind relates to the audience for different kinds of reports. Consider the example of a report written to a supervisor at a solar power company over the effectiveness of the solar panels currently used at a location. The report's primary audience may be an executive whose knowledge of the technicalities is very broad. The executive will read the report and understand the profits and losses, but will need to consult a technician to understand the technical aspects of panel usage. The content and language used for these two different audiences will need to be adjusted to fit the writing situation.

To help write for the specific document's audience, it is a good idea to define your reader and sketch out some qualities about them before you begin drafting. This information will help you persuade the reader to accept your research and conclusions, as well as help keep your own writing on task. It can also help you decide what research to include or eliminate from the report, how best to visually display your data, and other considerations to get your conclusion and/or recommendations accepted.

Ask Yourself

1. **Who is your reader?** Your reader should be someone with decision-making authority over your topic. They could implement recommended changes or just need the information you provide. They are action-takers in a corporation, organization, business, or agency. In some situations, the reader of a report may also be *a client*—a person who hired you to compile the research and write the report.
2. **What type of reader are they?** An expert, technician, executive, gatekeeper, or non-specialist?
3. **What is their background and knowledge level on the topic?** What are their needs, interests, and culture, and values? What will likely persuade them to implement your idea?

For example, imagine you researched the merits of four-day versus five-day workweeks for maximum productivity. Your research led to the conclusion that four-day workweeks would increase company revenue and employee satisfaction in several areas. You will want to frame your ideas for improvement in terms that management will be interested in, such as productivity, savings in building upkeep and utilities, and performance. Otherwise, they may be unconvinced that your solution will alleviate the burden of the problem.

The type of report you create will depend on the purpose of the document and who will read it. For example, you may wish to create a report to persuade them to make recommended changes, or perhaps you were asked to compile a report over current events or statuses at a company. The level of formality will also be a factor in your decisions over content and format.

There are several aspects of the report that you need to determine before drafting. Identifying these factors is vital to creating a report that will be accepted by the reader—whether the report is written for *internal* or *external readers*, and if the report is *solicited* or *unsolicited*.

Internal or External

- **Internal:** A report to someone within your organization (a business, a government agency, etc.). For example, if you submit a report to your supervisor that recommends improvements to more effectively reply to customer inquiries, you would create an internal report.
- **External:** A report that is written from one separate, independent organization or individual to another such entity. With an external report, you will need to not only persuade the reader to accept your conclusions on the topic, but also establish credibility. The typical example is an independent consultant writing a report on company productivity for another firm.

Solicited or Unsolicited

- **Solicited:** The recipient has requested the report. The solicitation may come in the form of a direct verbal or written request, but it is not uncommon for solicitations to be an indirect, open-bid to the public, and formally published for everyone to see. For example, a city

government will advertise for an independent contractor to reinforce the structural integrity of several local bridges. The city may announce the project's budget and solicit contractors to submit a report outlining what repairs they could make in exchange for the advertised budget.

- **Unsolicited:** The recipient has not requested your report. With unsolicited reports, you must convince the recipient that a problem or need exists in addition to convincing them to accept your conclusions and/or implement change.

Common Report Sections

There are several common sections in a report: a submittal letter, cover page, abstract or executive summary, table of contents, introduction, literature review, experiment/method/procedure, results, discussion, recommendations, conclusion, acknowledgments, references, and appendices. At first glance, these sections may seem a bit overwhelming. However, you have likely had some contact with basic reports structure with journal articles and other assigned class readings. Reports follow the same basic structure, referred to as IMRaD (Intro, Method, Results, and Discussion). Of course, the length and locations of these sections will vary, and some sections may be entirely eliminated, based on the purpose and audience of the report. In some industries, reports even use Excel files and other types of untraditional formats. The sections of a report can be easily categorized into three major groups—front matter, the report's body, and back matter.

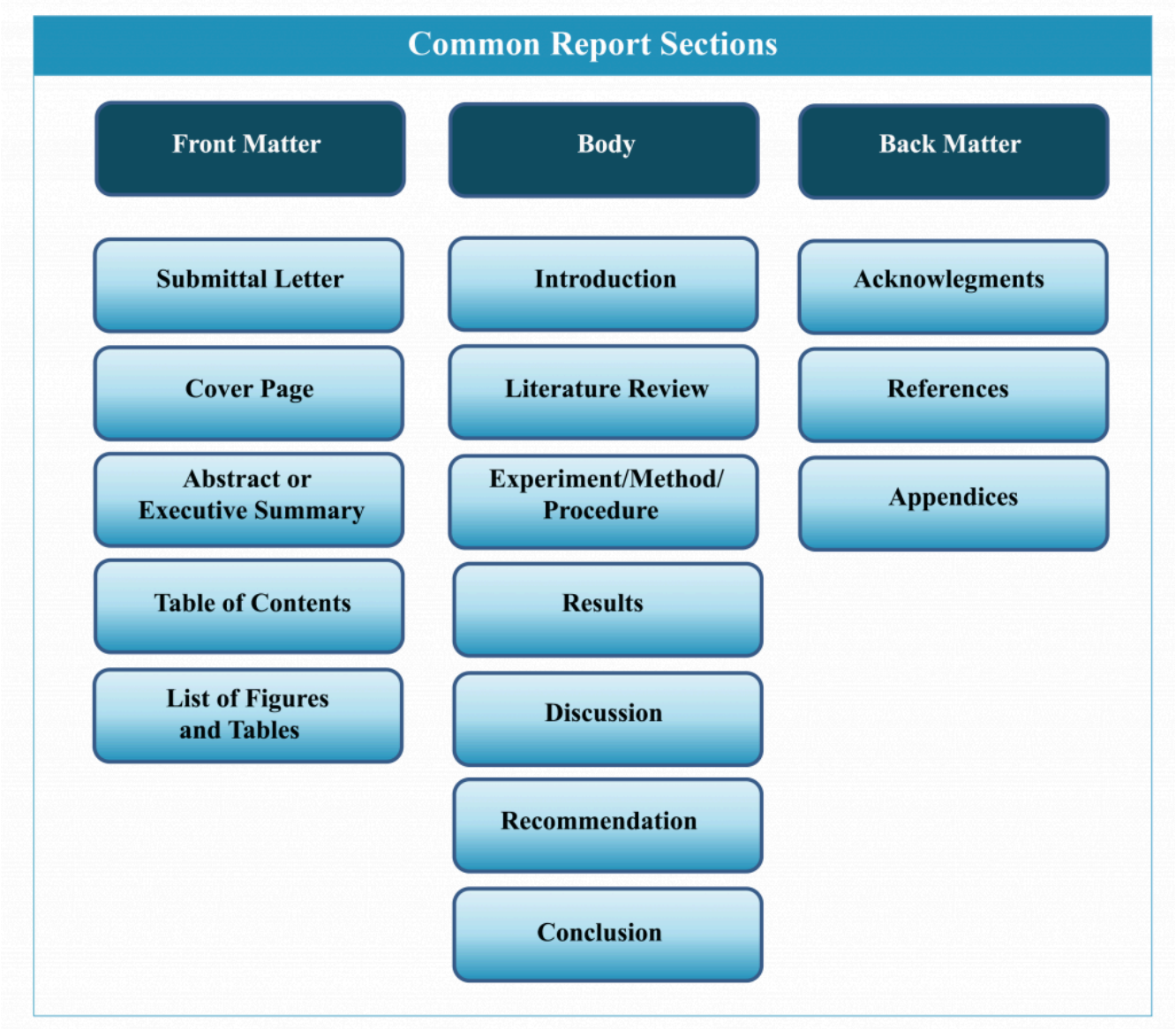


Figure 23.1

Front Matter

The front matter is made up of sections that introduce, provide context, and guide usage of a report. In most cases, it will include a submittal letter to the reader, an abstract or executive summary, a table of contents, and a list of figures and tables (if your report contains graphics).

Submittal Letter

The submittal letter is either attached to the outside of the report with a paper clip or is bound within the report. It is a transmittal document—used to explain the content and context of the report to the reader. It has a similar function to the cover letter in your job packet—they both explain the enclosed content. It is a communication from you—the report writer—to the recipient—the person for whom you created the report—who may even be paying you for your expert consultation.

Essentially, it says, "Here is the report that we agreed I'd complete by such-and-such a date. Briefly, it contains this and that, but does not cover this or that. Please let me know if it meets your needs." The submittal letter explains the *context*—the events that brought the report about. It contains information about the report that does not belong in the report itself, and could be viewed as a form of metadiscourse—a self-referential document that refers back to the main document to provide context.

Advanced Energy Group
(555) 555-5555
advanced.energy@gmail.com

Ms. Katherine Miles,

As per your request on Dec 12, 2017, we have spent the past three months researching the feasibility of adding solar panels to your main campus buildings. We have found that the installation of solar panels will reduce but not eliminate your current electrical costs. In the attached report, you will find details on our research and our conclusions for your location.

We first researched all buildings' suitability to sustain panels by referencing the structures' blueprints and discussing options with local contractors. Three buildings on your campus have the ability to be fitted with panels; however, only two have ample sun exposure for the panels to run efficiently. We then researched the costs associated with installation, in addition to the current electric needs of your campus and the expected output of power if installed (data is included in this report).

In the end, we have concluded that the installation of five solar panels fitted to the northwest section of the Smith Building's roof would provide an 80% decrease of your current electric costs after five years of use. Please see the attached report for details.

Thank you for your time, and we hope you found this research insightful. Please contact us at advanced.energy @gmail.com or 555-555-5555.

Sincerely,

Advanced Energy Research Team

Figure 23.2

Submittal letters often follow standard business letter format. If you write an internal report, use the memorandum format instead. In either case, the content and organization are the same:

- The first paragraph cites the name of the report, and puts it in italics. It also mentions the date of the agreement to write the report.
- The middle paragraph focuses on the purpose of the report and gives a brief overview of the report's contents.
- The final paragraph encourages the reader to get in touch if there are questions, comments, or concerns. It closes with a gesture of good will, expressing hope that the reader finds the report satisfactory.

As with any other element in a report, you may have to modify the contents of this letter (or memo) for specific situations. For example, you might want to add another paragraph, listing questions you would like readers to consider as they review the report.

Cover Page

Be sure to create a cover page for your report. It is a step that some writers forget. Without a label, a report is anonymous and gets ignored. The best way to create a cover page is to use your word processing software to design one on a standard page with a graphic box around the label information. Not much goes on the label: the report title, your name, your organization's name, a report tracking number (if any), and a date. There are no standard requirements for the cover page, although your company or organization may have its own requirements. See below for common characteristics of a cover page:

- **Design:** The cover page should be clear and easy to read, but can have some graphics or design interest to attract to the reader. However, do not go overboard on the "frills," like rainbow-colored letters or extraneous clipart. A disorganized or overly decorated cover page could lessen your credibility as a respectable writer.
- **Title:** It is necessary to have a highly concrete title consisting only of words that contribute directly to the report subject. Be sure that the title contains no filler and includes few abbreviations or acronyms, yet includes enough detail so the reader fully understands the content.
    - For example, "Sol Gel Method" is clearly incomplete compared to "The Synthesis of NZP by the Sol Gel Method." Of course, it is possible to overdo specificity as well: "The Role of Solid Oxide Fuel Cells in the Important Scientific Search for Energy Alternatives as Necessitated by the Recent Middle East Crisis and America's Energy Consumption" is painfully excessive and should be reduced to its essential elements. However, "The Importance of Solid Oxide Fuel Cells Research for Alternative Energies" is much more appropriate.

An Analysis of the Benefits of a Four Day Work Week Schedule at Mason Electronics

Jim D. Jones and Sophia Henderson
Butler, Smith, and Klein Group

272649475

Aug 12, 2017

Figure 23.3


Marvelous
MONDAY
Tasty
TUESDAY
Four vs Five: An Analysis of the Benefits and Detriments of Implementing a Four Day Work Week at Mason Electronics
What's up
WEDNESDAY
Jim D. Jones and Sophia Henderson
Butler, Smith, and Klein Group
Throwback
THURSDAY
272649475
Aug 12, 2017
Fantastic
FRIDAY

Figure 23.4

Abstract or Executive Summary

Most technical reports contain at least one abstract—sometimes two, in which case the abstracts play different roles. Abstracts summarize the content of a report, but the different types do so in different ways.

Descriptive Abstract: This type provides an overview of the purpose and content of the report. In some report designs, the descriptive abstract is placed at the bottom of the title page. In others, it appears on its own page. Descriptive abstracts are a concise, specific, and repetitive overview of the entire report. They highlight important content so that your supervisor or other researchers can determine whether the report is relevant to their interests and needs. The format and length of an abstract can vary depending on the business or field, though it is often around 100-300 words, depending on report length. In general, abstracts should follow the same chronological order as the report, contain brief but specific information from each section, and use phrases and sentences pulled directly from the report without changing the language. Your abstract may vary somewhat from the list below depending on the sections of your report. An abstract will generally contain the following information:

- Topic or problem
- Information on the participants (if any)
- Brief review of methodology (what you did)
- Statistical analyses
- Results of the study
- Implications of the study (the conclusions)

Executive Summary: Another common type is the executive summary, which also summarizes the key facts and conclusions contained in the report. Think of this as if you used a yellow highlighter to mark the key sentences in the report and then siphoned them all out onto a separate page and edited them for readability. Typically, executive summaries are one-tenth to one-twentieth the length of reports 10 to 50 pages long. For longer reports, ones over 50 pages, the executive summary should not go over two pages. The point of the executive summary is to provide a summary of the report—something that can be read quickly.

If the submittal letter, executive summary or abstract, and introduction strike you as repetitive, remember that readers do not necessarily start at the beginning of a report and read page by page to the end. They skip around—they may scan the table of contents, and then skim the executive summary for key facts and conclusions. They may carefully read only a section or two from the body of the report, and then skip the rest. For these reasons, reports are designed with some duplication so that readers will be sure to see the important information no matter where they dip into the report.

Table of Contents

You are familiar with tables of contents (TOC) but may never have stopped to look at their design. The TOC shows readers what topics are covered in the report, how those topics are discussed (the subtopics), and on which page numbers those sections and subsections start.

In creating a TOC, you have a number of design decisions:

- **Levels of Headings:** In longer reports, consider including only the top two levels of headings. This keeps the TOC from becoming long and unwieldy.
- **Indentation, Spacing, and Capitalization:** Items in each of the three levels of headings should be aligned with each other. Page numbers are right-aligned with each other. Main chapters or sections are all caps; first-level headings use initial caps on each main word; lower-level sections use initial caps on the first word only.
- **Vertical Spacing:** First-level sections have extra space above and below, which increases readability.
- **Leader Dots:** Leader dots horizontally connect the descriptive headings on the left to the page numbers on the right.

Make sure the words in the TOC are the same as they are in the text. As you write and revise, you might change some of the section headings, so do not forget to change the TOC accordingly.

List of Figures and Tables

If your document has more than two figures or tables, create a separate list of figures. The list has many of the same design considerations as the table of contents. Readers use the list of figures to quickly find the illustrations, diagrams, tables, and charts in your report. Complications arise when you have both tables and figures. Strictly speaking, *figures* are illustrations, drawings, photographs, graphs, and charts. *Tables* are rows and columns of words and numbers; they are not considered figures.

For longer reports that contain dozens of figures and tables each, create separate lists. Put them together on the same page if they fit, as shown in Figure 23.5. You can combine the two lists under the heading, “List of Figures and Tables.”

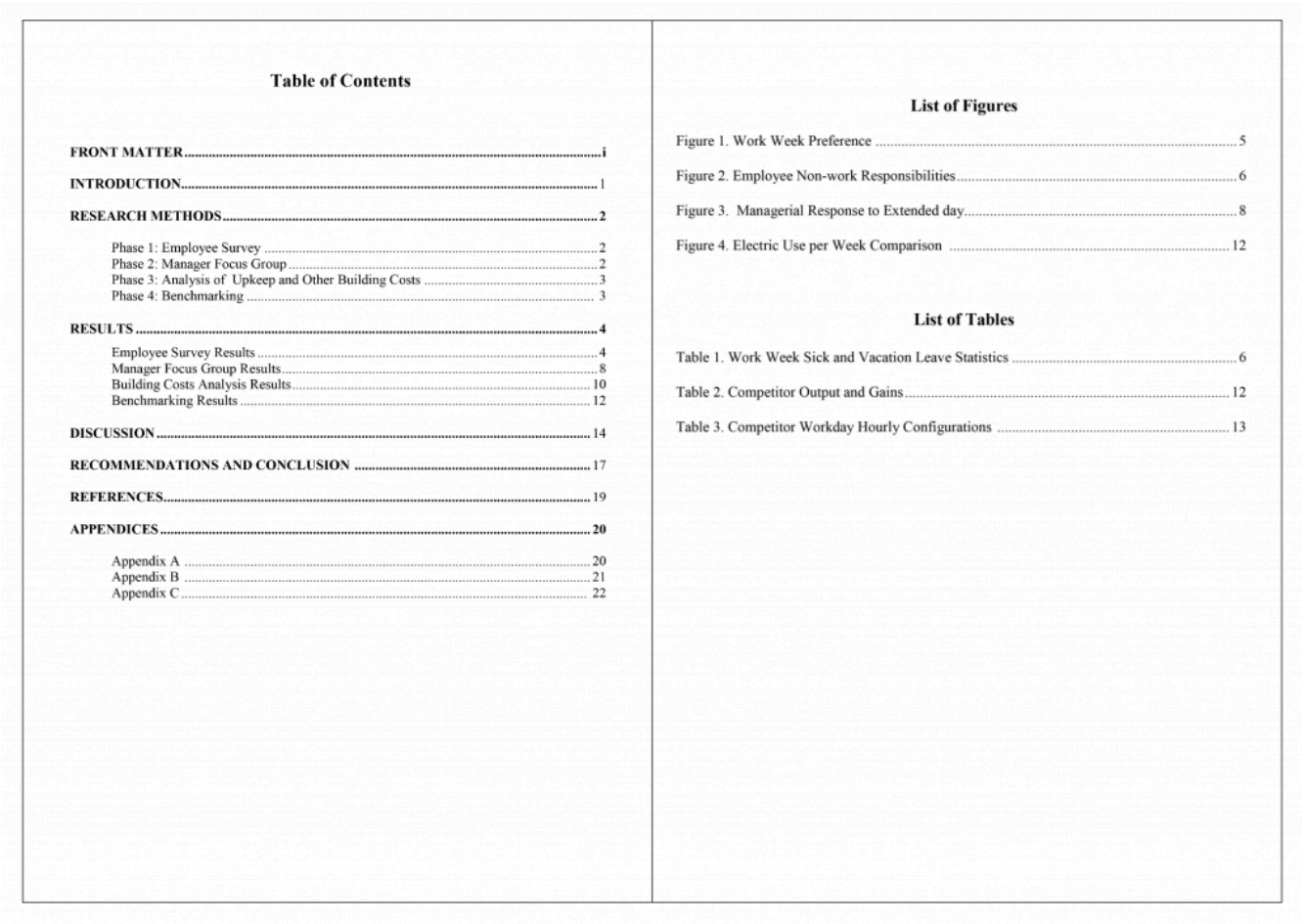


Table of Contents

List of Figures

List of Tables

Figure 23.5

Report Body

The report's body contains the report's content. In these sections, you will introduce your topic, tell us what research you found and how you obtained the information, discuss the significance of your findings, and conclude with your overall assessment of the topic, problem, or information gathered. It follows the IMRaD format and should leave the reader with a full understanding of the issue.

Introduction

An essential element of any report is its introduction. Make sure you are clear on its real purpose and content. In a technical report, the introduction prepares the reader to read the main body of the report. The introduction should offer immediate context for the reader by establishing the importance of the topic and by describing its nature and scope. You should describe your specific approach to the problem and establish how your investigative work meshes with the needs of the field or with other work that has been done. The "funnel system" of organization—moving from a broad approach to a gradually narrowed scope—is recommended. Present tense is preferred. An effective introduction will usually include the following rhetorical moves, in any order:

- Define the subject of the report.

- State the purpose of the report, preferably in one sentence.
- State the report's main point.
- Stress the importance of the subject, especially to the defined audience(s).
- Offer background information on the topic.
- Forecast the organization of the report.

Depending on which type of report you're writing, the purpose and main point may vary greatly. For example, for external analytical reports that propose a solution to an investigated problem, the purpose is to convince the client to take some sort of action, and the main point is that the proposed solution will remedy the problem. In reports that are persuasive, it's best to think of the main point as the report's thesis.

For a non-argumentative research report, however, the purpose may be to present an organized and coherent overview of the topic with corresponding graphics, and the main point may simply be to provide others with an educational resource. (Imagine an encyclopedia entry as a type of non-argumentative research report.)

Introductions range from one to several pages in length and must always include a clearly worded account of the report's objective; usually at the end of the introduction (Some writers even include a short separate subsection labeled "Objective"). However, the content and intent of the objective and purpose statement tend to overlap. It is always important to state your final conclusion, recommendation(s), or action you want the reader to take in the introduction, as it is the "main point" of the report.

The content of a report's introduction is similar to the introductions of proposals and other professional correspondence. The extent of which you incorporate this content depends on the purpose and the audience. For example, if your report is internal (written for your own supervisors), you may spend less space on background information (they likely know about the situation or problem), or if the report is solicited (you were asked for the report), you may not need as much emphasis on the importance. Conversely, if you write an unsolicited report advocating for a specific change, you will need to emphasize both the background information (to explain the problem) as well as the importance (to show a need for change). These are all considerations to make based on the type of report and the audience.

Your introduction may benefit from the addition of some data or research. You may want to provide statistics about the current situation to show importance or to establish your credibility. If you choose to include research in the introduction, focus on paraphrases or specific statistics—you do not want to bog down your introduction with heavy quotations or "filler" information. You will include more extensive research in the body of the report, so it is not needed here. The introduction should be to-the-point and revised to have maximum effect on the audience.

Literature Review

A literature review is most often found in published academic journal articles and scientific reports. It is a discussion of previously published research on the topic. It can contain theory, content of similar studies, and/or studies that led to your current research. In technical reports, an entire section of your paper may be devoted to a literature review. Literature reviews range from exhaustive searches to mere summaries of articles, but the fundamental objective is always the same—to establish the history of the problem investigated by summarizing the *what*, *how*, and *why* of the work that has already been done. Writing a literature review requires you to establish relationships among findings from other researchers and to condense many pages of published material into shorter segments. Your ability to assimilate material is critical.

Stylistically, literature reviews are often written in the past tense, but many authors favor the present tense if the research is recent. Passive voice may seem tempting to use, but active voice is preferred, because you can smoothly place the names of authors into the subject slot of the sentence: "Yoldas and Lloyd (1999) propose a chemical polymerization technique for the preparation of NASICON gels."

Literature Review

Genre scholars state that "there are too few studies on written business communication in particular business discourse communities" (Flowerdew & Wan, 2006, p.134). Scholars such as Flowerdew & Wan (2006), Rutherford (2005), and Killoran (2006) have attempted to fill this void by studying genre and its effects in documents found exclusively in the corporate world. Flowerdew and Wan's ethnographic study proved that classic genre analysis is applicable to newer genres such as tax computation letters. Rutherford's (2005) study of British OFR's yielded evidence of subgenres and the "Pollyanna effect" occurrences in these documents to assure struggling companies' stakeholders, while Killoran (2006) discovered a genre's ability to thrive in a new medium, in this case electronic, is based on adaptation and the capability to take on new genre applications.

Genres found in the medical community have been analyzed as well to contribute to the corporate business communication subset. While some would disagree that the medical community is "corporate," it is a high money making entity and is ran much like any other corporation. Dunmire (2000) studied the temporal nature of genre activity by analyzing medical and patient interactions, while Varpio et al (2007) visually analyzed optometric forms.

While these efforts have certainly contributed to defining and understanding the underlying constructs for some business communications, these studies have only focused on texts which appear in corporate, white-collar occupations, limiting the scope of analysis to a marginal group within certain, often inclusive, types of genre. If scholars are to answer the call of Flowerdew and Wan (2006), analysis on business communication documents found outside the corporate world must be addressed to more fully understand genre conventions.

Figure 23.6

Experiment / Method / Procedure

Any of the above titles are common names for this section. The goal is to summarize the *what*, *how*, and *why* behind your specific experiment or research design, with particular emphasis on the *what* and *how* so that other researchers can repeat your procedures if they desire. This section includes a description of the relevant apparatus and materials used. Photographs and diagrams can be used, sparingly, to help clarify the procedures. This section often contains the following information:

- Overview of your research goal and rationale for why you chose the research type(s)
- Research goals (What you plan to achieve through your research)
- Types or phases of research completed (Survey, secondary research, poll, etc.)
- Purpose of the research (What did you want to find out?)
- Information on the participants/subjects, if any and why you chose them (Biographical sketches, major demographics, numbers, agreements or payments, and/or statements of ethical principles)
- Materials, apparatus, or measures used (Physical aspects)
- Procedures followed (The process)

Stylistically, passive voice and past tense verbs are sometimes used in this section, but be sure that your sentences are written efficiently and contain simple subjects and verbs when possible. The basic form of directly stating "what was done; why it was done that way" should be used repeatedly in this section.

Results

The Results and Discussion work together to present the findings of your research. The Results will be directly related to your Method. However, take care not to include your experimental methods here—that is the job of the previous section. Focus on *what* you found, not *how* you found it.

The main difference between the Results and Discussion is that the Results contains raw data as it was reported or discovered. It must be objective, unbiased, emotionless, and free from judgment. The Discussion interprets and explains the significance of the data, forming an argument by declaring what you think certain data means and how it fits together. Imagine your report is a puzzle. By the end of the report, you want the reader to see the complete picture. In this scenario, the Results are your puzzle pieces. The Discussion is where you assemble the pieces for the reader.

For most readers, the Results is an important section of the report—your readers must easily find your data in order to interpret it. You straightforwardly present the results of your experiment, usually with minimal discussion. Naturally, the use of tables, graphs, and figures is especially important here, as are explanations of how data were derived. Your Results will likely contain the following content:

- A brief introductory summary of your major results.
- One or more detailed paragraphs for each of the major findings or ideas.

- Data displayed using charts, graphs, and tables for reference.
- Brief concluding statement of major findings.
- Transition to the Discussion.

The Results should include solid data you found through research. If you are writing an informational report, the data is crucial for the report's purpose—to give statistics and other data to the reader. With other types of reports, such as recommendation or feasibility, your data will inform the reader, but also lay the groundwork for an eventual conclusion or recommendation. You may not necessarily include *all* the data you found on the topic, but you must include all *relevant* data. Include the information (or areas of information) that will be of interest and applicable to the report's audience and purpose. What does the reader need to know to trust your interpretations or recommendations later in the report? What was interesting, surprising, or significant in shaping your analysis or opinions?

When drafting and revising this section, your style should focus on showing that you are reporting the information, not interpreting it (yet). Avoid terms such as seems, appears, means, looks as if, indicates, suggests, we believe, we think, and descriptor words that indicate positive or negative results such as excellent, worse, better, great, etc.

Discussion

In the Discussion, logical deductions are made, errors of or ambiguities in the data should be discussed, and causal relationships must be confirmed. It is important not to rely on a table or figure to do the work for you—you must concisely interpret and explain the meaning of your results. Remember, this is where you put your puzzle together for the reader. Beware of making sweeping generalizations or unfounded statements. Do not be afraid to discuss results and data from different sections together if doing so helps you develop a stronger argument than viewing these pieces of information separately. Your Discussion will likely contain the following content:

- Introductory paragraph with overall statement about your content
- Explanations for the conclusions you have about the research (What do they mean? Why do you think that is? Explain your reasoning.)
- References to the data in the Results (You will not discuss any new data—explain the data you have already written about.)
- Summary of the main points and transition to the Recommendations or the Conclusion

You may feel like the Discussion is repetitious, as you refer to information established in other sections of the report. The key difference is that the Discussion *analyzes* the information and *displays* what it all means for the reader, which is why the Discussion commonly stands alone. In your future career, there could be some situations where you are asked to combine the data and interpretation into a "Results and Discussion" section, or combine the "Discussion and Conclusion" (such as with journal articles). If such combinations occur, it is important not to minimize or reduce the analysis and critical thinking components of the Discussion. However, in most scenarios, a stand-alone Discussion is the most effective way to present your analysis and interpretation to persuade the reader. You may also

consider referring to the key literature of your introduction or literature review if these sections are included in your report. You can enlighten your readers (and elevate your work) by discussing your data in relation to the published results of others.

Passive voice may seem tempting, but active voice is valuable, especially as you make logical assertions and claims based on your interpretation of the data. As a rule, use past tense to summarize your actual results ("95 percent of respondents stated…"); use present tense to present established facts or present your interpretations ("The helium sintering data show…").

Recommendations

The Recommendations follows the Discussion, if your report's purpose is to recommend a specific action or change, or to give an overall assessment of a situation, such as with feasibility, recommendation, or project-completion reports. This section should be concise and to the point. Recommendations should be based on your data, and all recommendations should link to research found in the Results and Discussion. Your Recommendations will likely contain the following content:

- Transition using signal phrases and headings
- Restatement of the report's main points (What did your study show/demonstrate? What did you prove/disapprove/not prove?)
- Statement of recommendations (Identify 2-5 actions that the reader should follow. Consider using bullets to contrast your recommendations and make them easy to find on the page.)

The Recommendations and Conclusion can be combined into one section or be divided into two separate sections. The choice depends on the type of document, the purpose, and the audience.

Conclusion

In most forms of writing, we use the word *conclusion* to refer to that last section or paragraph of a document. The Conclusion should provide the exact conclusions you have arrived at as they relate to your experimental objectives. Conclusions may be listed and numbered, and it should be made clear how they contribute to the understanding of the overall problem. In a sense, you are going back to the big picture provided by your introduction, incorporating your conclusions into that picture.

Like the Recommendations, this section should be concise and to the point. This section may be short—often about the same length as the abstract. If the Method looks legitimate, the Results appear thorough, and the Discussion does a clear job explaining how it fits together, then your Conclusion should be well received without extras.

There are at least four ways to conclude a report: a summary, a true conclusion, a combination, and nothing. More often than not, the final section is some combination of the first two ways of ending the document.

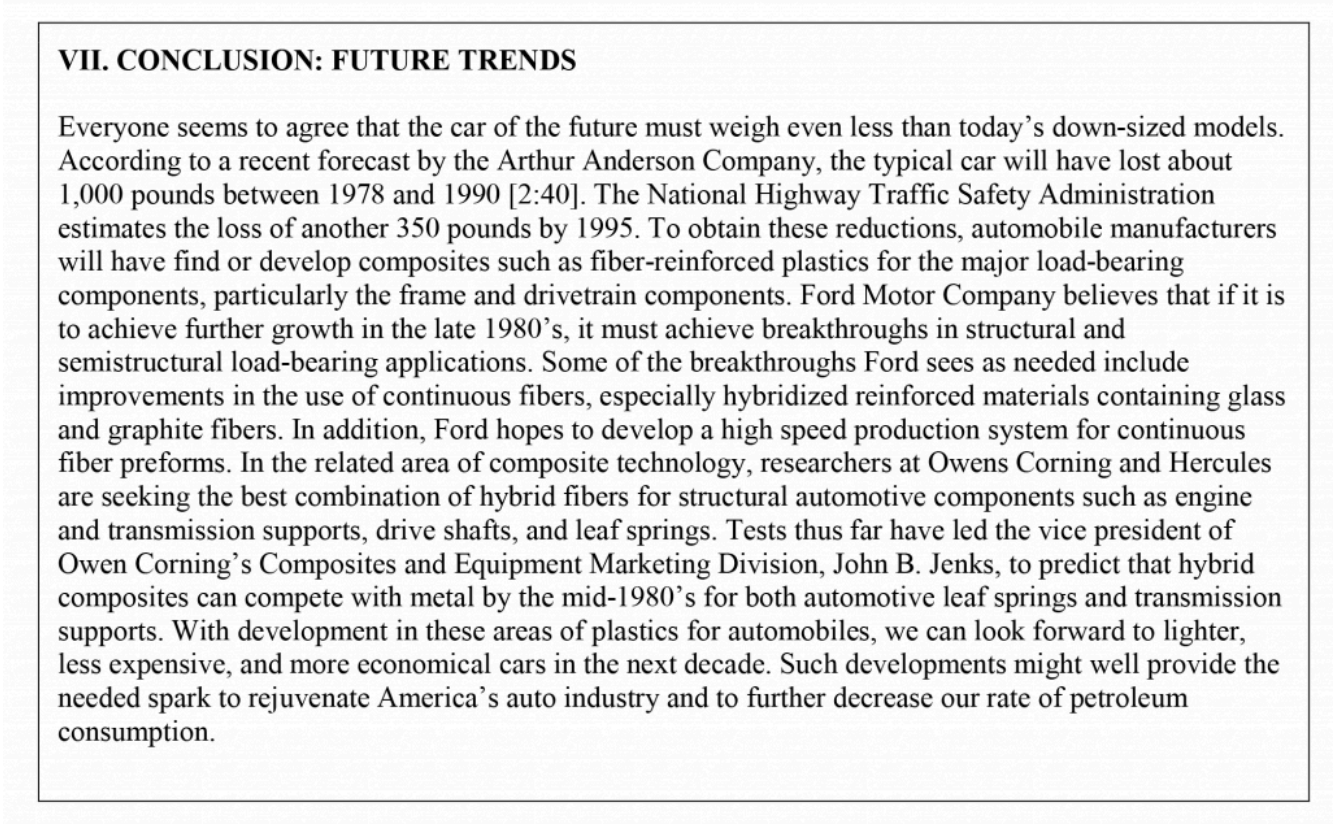
Summary: Review and summarize the high points. If your report is rather long, complex, heavily detailed, and if you want your readers to come away with the right perspective, a summary is in order. For short reports, summaries can seem absurd—the reader thinks, "You've just told me that!" Summaries need to read as if time has passed, things have settled down, and the writer is viewing the subject from higher ground.

"True" Conclusion: A "true" conclusion is found in most types of documents. For example, in the body of a report, you might present conflicting theories and explore the related data. Or you might have compared different models and brands of some product. In a "true" conclusion, you would present your resolution of the conflicting theories, your choice of the best model or brand—your final conclusions.

VIII. SUMMARY

This report has shown that as the supply of fresh water decreases, desalting water will become a necessity. While a number of different methods are in competition with each other, freezing methods of desalination appear to have the greatest potential for the future. The three main freezing techniques are the direct method, the indirect method, and the hydrate method. Each has some advantage over the others, but all three freezing methods have distinct advantages over other methods of desalination. Because freezing methods operate at such low temperatures, scaling and corrosion of pipe and other equipment is greatly reduced. In non-freezing methods, corrosion is a great problem that is difficult and expensive to prevent. Freezing processes also allow the use of plastic and other protective coatings on steel equipment to prevent corrosion, a measure that cannot be taken in other methods that require high operating temperatures. Desalination, as this report has shown, requires much energy, regardless of the method. Therefore, pairing desalination plants with nuclear or solar power resources may be a necessity. Some of the expense of desalination can be offset, however…

Figure 23.7



VII. CONCLUSION: FUTURE TRENDS

Everyone seems to agree that the car of the future must weigh even less than today's down-sized models. According to a recent forecast by the Arthur Anderson Company, the typical car will have lost about 1,000 pounds between 1978 and 1990 [2:40]. The National Highway Traffic Safety Administration estimates the loss of another 350 pounds by 1995. To obtain these reductions, automobile manufacturers will have find or develop composites such as fiber-reinforced plastics for the major load-bearing components, particularly the frame and drivetrain components. Ford Motor Company believes that if it is to achieve further growth in the late 1980's, it must achieve breakthroughs in structural and semistructural load-bearing applications. Some of the breakthroughs Ford sees as needed include improvements in the use of continuous fibers, especially hybridized reinforced materials containing glass and graphite fibers. In addition, Ford hopes to develop a high speed production system for continuous fiber preforms. In the related area of composite technology, researchers at Owens Corning and Hercules are seeking the best combination of hybrid fibers for structural automotive components such as engine and transmission supports, drive shafts, and leaf springs. Tests thus far have led the vice president of Owen Corning's Composites and Equipment Marketing Division, John B. Jenks, to predict that hybrid composites can compete with metal by the mid-1980's for both automotive leaf springs and transmission supports. With development in these areas of plastics for automobiles, we can look forward to lighter, less expensive, and more economical cars in the next decade. Such developments might well provide the needed spark to rejuvenate America's auto industry and to further decrease our rate of petroleum consumption.

Figure 23.8

For most reports, you will need to include a final section. When you plan the final section of your report, think about the functions it can perform in relation to the rest of the document. A conclusion does not necessarily just summarize a report. Instead, use the conclusion to explain the most significant findings you made in relation to your report topic.

Combination: In practice, the preceding ways of ending reports are often combined. You can analyze final sections of reports and identify elements that summarize, elements that conclude, and elements that discuss something related but at a general level.

Below are some possible combinations for a mixed conclusion:

- Provide a brief, general look to the future; speculate on future developments.
- Explore solutions to problems that were discussed in the main body of the report (refer to the Recommendations, if any).
- Discuss the operation of a mechanism or technology that was described in the main body of the report.
- Provide some cautions, guidelines, tips, or preview of advanced functions.
- Explore the economics, social implications, short and long-term consequences, problems, legal aspects, advantages, disadvantages, benefits, or applications of the report subject (but only generally and briefly).

Eschew the conclusion! It is possible to end a document with no conclusion (or final section) whatsoever. However, in most cases, that is a bit like slamming the phone down without saying goodbye. **The nothing conclusion** will likely be used in cases where you were asked to compile the data for another person(s), such as in an informational report. The data may be used in order for others to make decisions, such as managers or other departments within a company. For example, if you wrote an informational report on a new ionic-polymer metal composite on the market, you would write about usage, applications, and current research, but skip the conclusion, as your manager or the physical testing department would make the decision whether or not to start using it.

Back Matter

The back matter of your report contains sections that give additional information about and attributions for the report's content. It contains acknowledgments and references, as well as appendices with more data to help the reader fully understand the report's informational basis.

Acknowledgments

If appropriate, briefly recognize any individual or institution that contributed directly to the completion of the research through financial support, technical assistance, or critique. In a thesis, this section may appear just before the introduction.

References

Documentation styles vary according to professionals and fields. For a technical writing class, you may be using either MLA or APA style, while engineers use the IEEE system.

References

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Figure 23.9

Document all secondary sources (sources created by other authors) used in the report, whether you directly quote, paraphrase, or summarize. Whether it comes from a book, article, a diagram, a table, a web page, or a product brochure—it is still borrowed information. If you create your own data through primary research (conducting your own interviews or surveys, for example), you do not need to include these on the reference list, but all secondary sources must be properly cited.

Appendices

An "Appendix" presents supplementary material that was not included in the main body of the report because it would have detracted from the efficient or logical presentation of the text, usually either by sheer bulk or level of relevance. As with figures and tables, appendices should be numbered or lettered in sequence; i.e., "Appendix A, Appendix B," and so on.

What do you put in an appendix? Anything that does not comfortably fit in the main part of the report, but cannot be left out of the report altogether. The appendix is commonly used for large tables of data, interview transcripts, large chunks of sample code, fold-out maps, background that is too basic or too advanced for the main text, or large illustrations that do not fit in the body of the report. It could also contain a list of organizations relevant to the material of the report, questions for surveys conducted, or the derivation of an equation that was used in the text but could not be referenced because it did not originally appear in a text that could be correctly cited. Anything you feel is too large or lengthy, or that you think would be distracting and interrupt the flow of the report, is a good candidate for an appendix.

Design and Format

Technical reports (including handbooks and guides) have various designs depending on the industry, profession, or organization. This chapter gives an overview of traditional design. If you are taking a technical writing course, ask your instructor for any design specifications they have for your documents. The same is true if you are writing a technical report in a science, business, or government context. Organizations very often have their own stylesheets on which all organizational document designs are based, so make sure the design presented in this chapter is acceptable. This is especially true if you are writing a report for publication—each journal provides its own guidelines for submission.

In general, reports should be typed, double or single spaced on 8-1/2 x 11 paper on one side of the page only, and letter-quality print or better is expected. The spacing and margins are often dictated by the audience and genre. For example, in technical fields, single spacing is often preferred, while some classroom instructors may prefer another size. Refer to your guidelines or examples of similar reports to ensure you use correct spacing.

You will likely have several pages of Front and Back Matter in your document, such as the transmittal letter, cover page, table of content, and reference page. The information below discusses design considerations for the main body of the report.

Headings

Use headings to mark off the different topics and subtopics covered. Headings are the titles and subtitles you see within the actual text of professional scientific, technical, and business writing. Headings are like the parts of an outline that have been pasted into the actual pages of the document.

Headings are an important feature of professional technical writing; they alert readers to upcoming topics and subtopics, help readers find their way around in long reports and skip what they are not interested in, and break up long stretches of straight text. They also keep you (the writer) organized and focused on the topic. The following are some helpful tips for incorporating headings in a report:

- **Use self-explanatory headings**: Instead of "Background," make it more specific, such as "Physics of Fiber Optics."
- **Make headings indicate the range of topic coverage**: Do not exclude major section concepts or descriptions for brevity.
- **Avoid "stacked" headings**: Avoid two consecutive headings without intervening text.
- **Avoid pronoun reference to headings**: If you have a heading, "Torque," do not begin the sentence following it with something like, "This is a physics principle….."
- **Omit articles from the beginning of headings**: For example, "The Pressurized Water Reactor" can easily be changed to "Pressurized Water Reactors."
- **Avoid headings as lead-ins to lists or as figure titles**: Always include text that describes and provides context for lists and subtitles.
- **Avoid "widowed" headings**: Keep at least two lines of body text with the heading, or force it to start the new page.

Page Numbering

Page numbering style used in *traditional* report design differs from *contemporary* report design. Check with your instructor or employer to ensure you are following the correct format. Below is a list of general page number requirements:

- **Traditional:** Use lowercase Roman numerals in front matter (everything before the introduction) (i, ii, iii). All pages in the report (within but excluding the front and back covers) are numbered unless the format style of the field states otherwise.
- **Contemporary:** All pages throughout the document use Arabic numerals (1, 2, 3). On special pages, such as the title page and page one of the introduction, page numbers are not displayed.

Page numbers can be placed in one of several areas on the page. Usually, the best and easiest choice is to place page numbers at the bottom center of the page (remember to hide them on special pages).

Bulleted and Numbered Lists

In the body of a report, use bulleted, numbered, and/or two-column lists where appropriate. Lists help emphasize key points, by making information easier to follow, and by breaking up solid walls of text. Always introduce the list so that your audience understands the purpose and context of it. Whenever practical, provide a follow-up comment, too. Below are some tips for using lists in a report:

- Use lists to highlight or emphasize text or to enumerate sequential items.
- Use a lead-in to introduce the items and indicate the meaning or purpose of the list.
- Use consistent spacing, indentation, punctuation, and caps style for all lists.
- Use parallel phrasing.
- Ensure each item in the list reads grammatically with the lead-in.
- Avoid using headings as lead-ins for lists.
- Avoid overusing lists; using too many lists destroys their effectiveness.
- Use similar types of lists consistently in the same document.
- Following up a list with text helps your reader understand context for the information distilled into list form.

Graphics

In a technical report, you are likely to need drawings, diagrams, tables, and charts. Display data that is relevant to your topic and goals, interesting or surprising, or complex data that can be clarified by a visual. These not only convey certain kinds of information more efficiently but also give your report an added look of professionalism and authority. If you have never put these kinds of graphics into a report, there are some relatively easy ways to do so—you do not need to be a professional graphic artist. Common software such as Microsoft Word, Excel, and Google Docs can create effective charts and graphics for a report, while freeware such as Inkscape and Gimp are available online.

Tables and figures should be numbered consecutively throughout the text, and, in a thesis or long report, separate lists of tables and figures are normally included at the beginning. Tables and figures should always have descriptive captions, and if they come directly from sources then the sources must be properly credited. Never present tables and figures without some useful interpretation of them in the text. In other words, graphics should clarify the information in the text, while the text should explain and support the graphics. Always ensure your graphics are ethical and display honest data.

Revision Checklist for Analytical Reports

As you review and revise your proposal, you'll want to check for certain instances or issues:

- **Make Preplanning Decisions:** Identify what kind of report you will be writing (internal/external; solicited/unsolicited), and identify the audience type, skill level, needs, and interests.

- **Use the Right Format:** Often, reports follow a block format, but check with your instructor or proposal submission guidelines to insure you are using the format requested. If there are samples provided, use them for visual comparison.
- **Check Submission Guidelines:** How should the report be submitted? What types of follow-up documents or actions are connected to your proposal if accepted? Who will these documents address, and when are they required?
- **Draft Your Report:** Make decisions about the type of content/sections to include in your report to meet the requirements of the submission, the requirements for the type of report, and the most effective way to present your idea to the reader
- **Check Each Section's Purpose:** Report sections can seem redundant; however, each section's content varies due to its purpose (For example, the Results should give data, but the Discussion has data and interpretation. The Submittal letter provides context while the Abstract has a concise summary of the report's content). Check each section to see that it fully fulfills its purpose.
- **Style and Design:** Ensure that the sections of your report are in a logical, natural order, you include all front and back matter relevant to the report's message, and that you use sub-headers and bullets (and any other formatting styles) correctly.
- **Revise, Revise, Revise:** A less than professional, grammatically-incorrect report can be rejected. Ensure you have included all content necessary, and revise and edit to ensure clarity and correct style of the audience.

Attributions

24.

PROPOSALS

by Staci Bettes

Introduction

This chapter focuses on the *proposal*—a type of document that gets you or your organization approved or hired to complete a project, or requests time and resources to study difficult problems. The proposal is your opportunity to pitch your idea for change (oftentimes an improvement) within an organization, or to draft a research plan to investigate an issue that is of concern to your institution. Proposals often demonstrate that a problem or opportunity exists that needs attention, and addresses a very specific audience with the authority to move your suggestions forward.

A *proposal* is an offer or bid to complete a project for someone. They may contain other elements—technical background, recommendations, results of surveys, information about feasibility, and so on. But what makes a proposal "a proposal" is it asks the audience to approve, fund, or grant permission to do the proposed project. It should contain information that would enable the reader to decide whether to approve a project, to approve or hire you to do the work, or both. To write a successful proposal, put yourself in the place of your audience—the recipient of the proposal—and think about what sorts of information that person(s) would need in order to feel confident having you complete the project.

It is easy to confuse proposals with other kinds of documents in technical writing. Imagine that you have a terrific idea for installing some new technology where you work, and you write up a document explaining how it works, showing the benefits, and then urging management to install it. All by itself, this would *not* be a complete proposal. This is a feasibility report, which studies the merits of a project and then recommends for or against it. However, all it would take to make this document a proposal would be to add elements that ask management for approval for you to go ahead with the project. A main difference between a proposal and other documents is that a proposal will sell the *writer* (or the writer's organization) as the one to complete a future project.

In a technical writing course, the proposal assignment is an opportunity for you to present an idea you have to improve a certain aspect of a company, organization, center, or other business. It is written to a specific, known reader, who has the power to approve or deny your project. A good proposal often leads

to conducting research and creating a report; therefore, whatever topic you choose, you must be able to conduct research on it, which will be integrated into that final report. In addition to primary research such as interviews and surveys, if your technical writing course requires that you integrate scholarly research into your final report, choose a topic for which you can readily find such material.

Not all research topics are appropriate for technical writing. Topics that are based on values and beliefs do not fall into the category of *technical*. Historical and literary topics do not qualify. For example, a proposal on the topic, "*Gone with the Wind* is the best book ever written" would not be appropriate, as you cannot prove and verify an opinion—everyone has their own taste. However, you could write a proposal to research the feasibility of declaring *Gone with the Wind* the "official novel" of Atlanta, Georgia.

Types of Proposals

Consider the situations in which proposals occur. A company may send out a public announcement requesting proposals for a specific project. This public announcement—called a request for proposals (RFP)—could be issued through websites, emails, social media, newspapers, or trade journals. Firms or individuals interested in the project would then write proposals in which they summarize their qualifications, project schedules and costs, and discuss their approach to the project. The recipient of all these proposals would then evaluate them, select the best candidate based on the plan which best suits the company's needs, and then work up a contract.

But proposals can also be less formal. Imagine that you are interested in doing a project at work (for example, investigating the merits of bringing in new technology to increase productivity). You met with your supervisor and tried to convince her of this. She might respond by saying, "Write me a proposal and I'll present it to upper management." This is more like the kind of proposal you will write in a technical writing course.

There are several aspects of the proposal that you need to determine before drafting. Identifying these factors is vital to creating a proposal that will be accepted—whether the proposal is written for *internal* or *external readers*, the proposal is *solicited* or *unsolicited*, and if the solution is *known* or *unknown*.

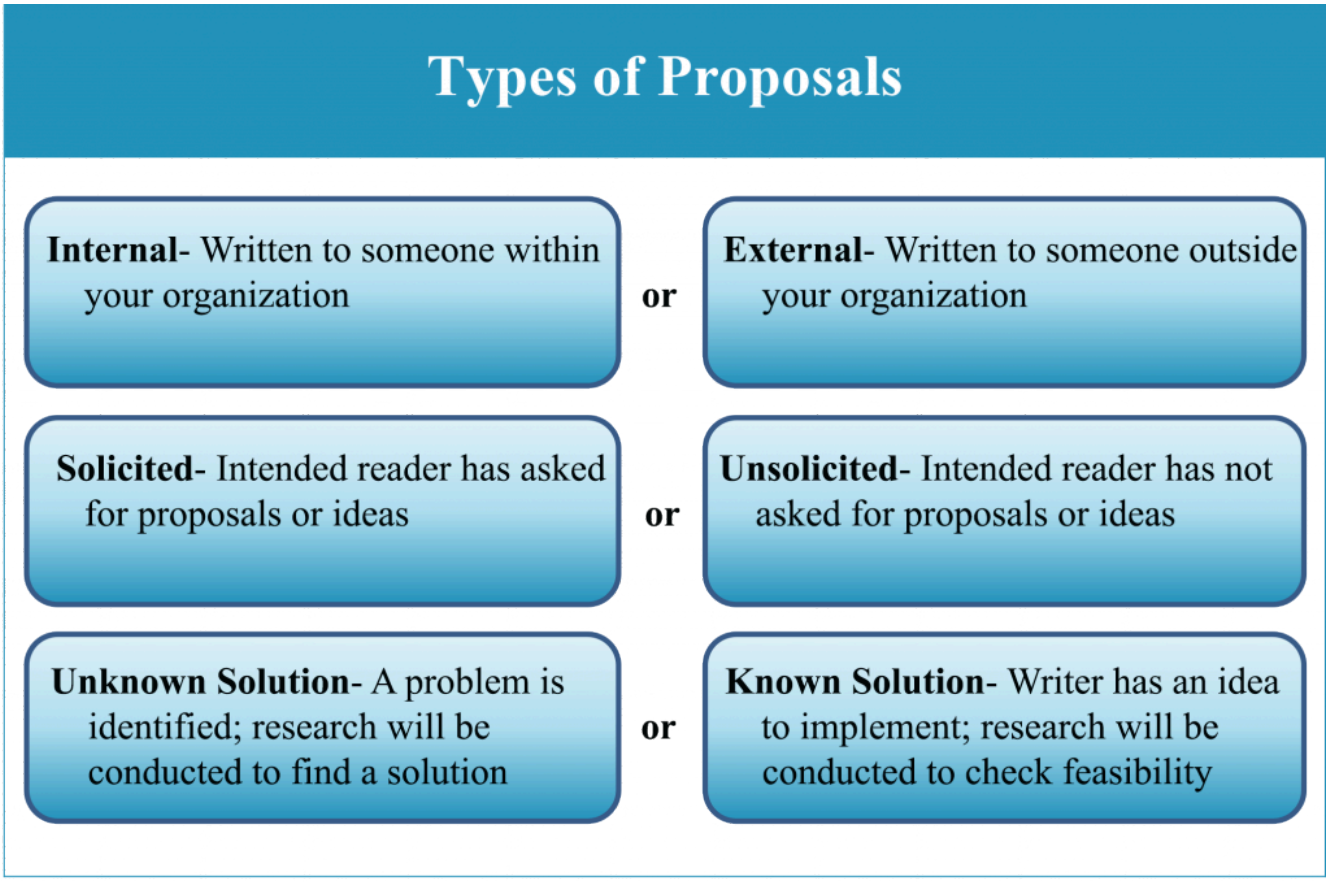

Figure 24.1

Internal or External

Internal: A proposal written to someone within your organization (a business, a government agency, etc.). With internal proposals, you may not have to include certain sections (such as qualifications) or as much information in them. For example, if your manager asks for ideas to improve the average time it takes to return customer inquiries, you would create an internal proposal.

External: A proposal written from one separate, independent organization or individual to another such entity. With an external proposal, you will need to not only persuade the reader that you have a solid plan, but establish your credibility with the reader. The typical example is an independent consultant proposing to do a project for another firm.

Solicited or Unsolicited

Solicited: The recipient has requested the proposal. If you have been asked to submit a proposal, it is considered solicited. The solicitation may come in the form of a direct verbal or written request, but normally solicitations are indirect, open-bid to the public and formally published for everyone to see. A request for proposal (RFP), request for quotation (RFQ), and invitation for bid (IFB) are common ways to solicit business proposals for business, industry, and the government.

Proposals can also be solicited on a local level. For example, you could be explaining to your boss about a new software you think should be installed in the office; your boss might get interested and ask you to write up a proposal that offered to do a formal study of the idea.

Unsolicited: The recipient has not requested your proposal. With unsolicited proposals, you sometimes must convince the recipient that a problem or need exists before you can begin the main part of the proposal. Unsolicited proposals are the "cold calls" of business writing. They require a thorough understanding of the market, product and/or service, and their presentation is typically general rather than customer-specific. They can, however, be tailored to specific businesses with time and effort, and the demonstrated knowledge of specific needs or requirement can transform an otherwise generic, brochure-like proposal into an effective sales message.

Getting your tailored message to your target audience is often a significant challenge if it is unsolicited. Unsolicited proposals are often regarded as marketing materials, which are intended more to stimulate interest for a follow-up contact than make direct sales. A targeted proposal is your most effective approach, but you should recognize the importance of gaining company, service, or brand awareness as well as its limitations.

Known Solution or Unknown Solution

Unknown Solution: You can identify a problem but are unsure what the solution is without further inquiry. Your proposal will focus on describing the problem, showing need for improvement, and planning research to discover the most effective solution. With an unknown solution, you may have a hypothesis—an idea that you think will solve the problem. However, this "educated guess" needs to be proven or disproven through research. The findings and recommendations will be included in a future report (e.g. recommendation report). For example, you notice that the office computers are lagging and crashing often but are unsure why. You would propose research on making the computers more efficient.

Known Solution: Instead of focusing on a problem that needs research, your proposal focuses on feasibility—i.e. can a specific solution resolve the problem, and what is the best way to implement the specific action, item, or idea? You propose research on areas such as cost, effectivity, location, and other factors connected to your solution. An example of a known solution is proposing your department replace a dozen 2016 Dell computers with the newest MacBook Pro model in an effort to improve computer speed, decrease user frustration, and increase employee productivity.

Proposal, Purpose, and Audience

Remember that, in a technical writing course, the proposal assignment serves several purposes:

- It gives you some experience in writing formal requests.
- It gets you started planning your major assignment.
- It gives your instructor a chance to work with you on your project to make sure you have a viable topic.

For the second and third reasons, you need to include specific elements in your proposal (as noted in your assignment sheet), some of which may not seem appropriate in a real-world proposal.

The proposal is often the beginning of a weeks-long research and writing process that goes through many stages until it gets to the end point: the recommendation report. In this case, you only submit the proposal once during this process; in a real-world setting, you may have to submit a proposal multiple times—making corrections, adding details to your research plan—before you receive approval to move forward with the project. And even after submitting the proposal and receiving permission, you may need to write and submit additional documents along the way: a progress report, an outline, an annotated bibliography, a graphics draft, a recommendation report draft, and a final recommendation report. Be careful to use the term "proposal" only if you are specifically referring to the proposal stage of your project.

Another point to keep in mind relates to the audience for different kinds of documents that may be produced for the same project. Consider the example of a proposal written to a supervisor at a solar power company suggesting the creation of a policy manual for residential installers. The proposal's audience may be an executive whose knowledge of the technicalities is very broad. Let us imagine the executive approves the proposal and requests completion of the manual, which will be produced well after the proposal. The manual's audience is the technicians, who may have more specialized knowledge than the executive. The content and language used for these two different audiences will need to be adjusted to fit the writing situation.

To write for the specific document's audience, it is a good idea to define your reader and sketch out some qualities about them before you begin drafting. This information will help you effectively persuade the reader to approve your proposed project, and help you stay on task writing for that reader. It can also help you shape your proposed research strategy and guide the type of information you include in your proposal.

Ask Yourself

1. **Who is your reader?** Your reader should be someone with decision-making authority over your problem. Theoretically, they could implement any changes you ultimately suggest. They are an action-taker in a corporation, organization, business, or agency.
2. **What type of reader are they?** Expert, technician, executive, gatekeeper, and/or non-specialist?
3. **What is their background and knowledge level on the topic?** What are their needs and interests? What will likely persuade them to approve your proposed idea? Wants? Values? For example, if you want to request time and resources to investigate whether changing your company's workweek schedule from a standard five days to four extended work days, you would want to frame the idea in terms that management would be interested in—increases in productivity, savings in building upkeep and utilities, and so on.

Common Proposal Sections

The following provides a review of the sections you will commonly find in proposals. Do not assume that these sections must be in every proposal you write, nor that they have to be in the order they are listed. Refer to the assignment sheet provided by your instructor (or if on the job, review all content and submission requirements) and consider other kinds of information unique to your topic that should be included in your particular proposal.

Most proposals include some common sections: introduction; description of the problem, opportunity, or situation; background of the problem; method and procedure; a schedule; cost and required resources; benefits and feasibility; conclusion; and references (see Figure 24.2).

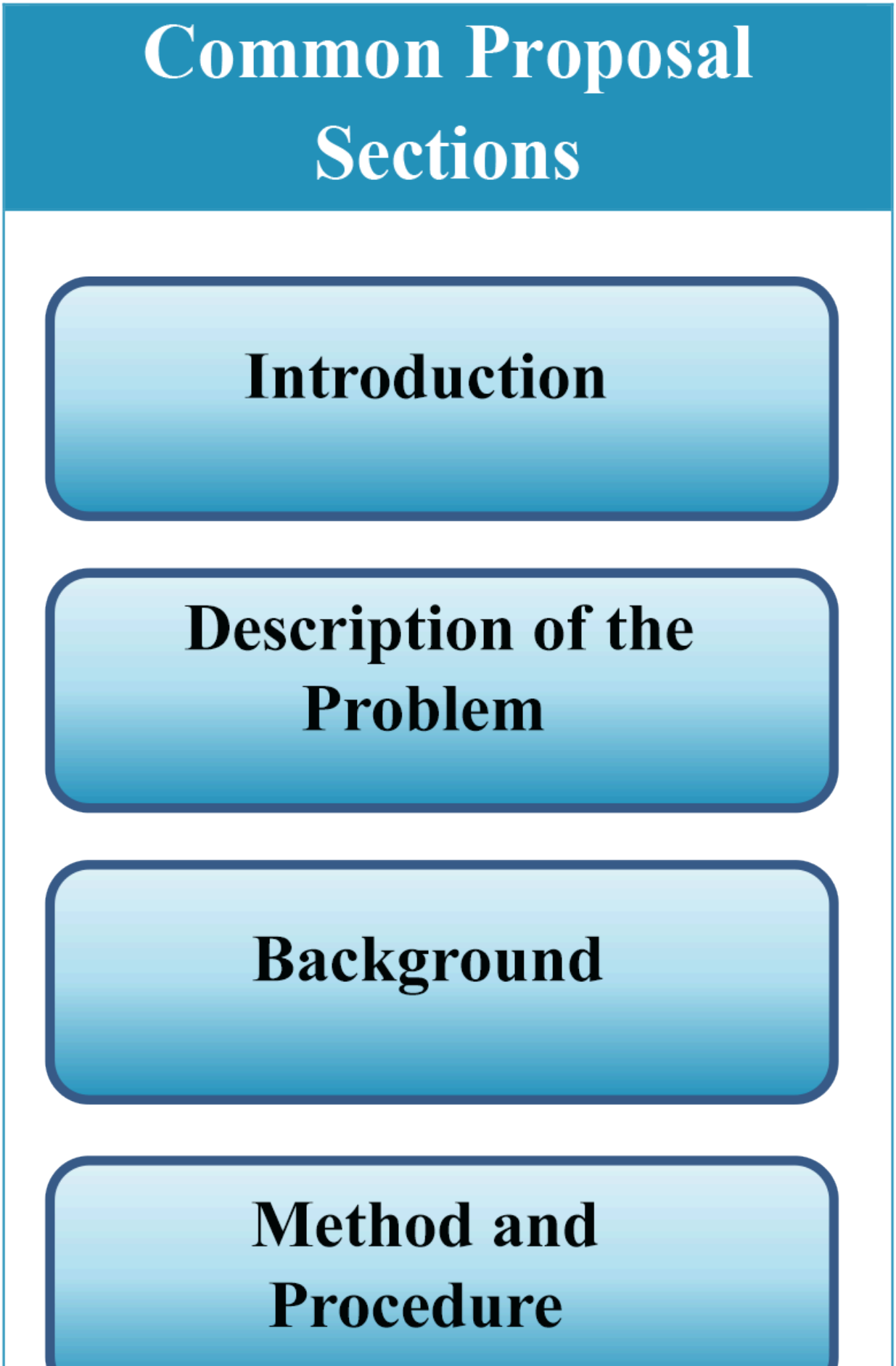
Common Proposal Sections
Introduction
Description of the Problem
Background
Method and Procedure

Figure 24.2

Introduction

Plan the introduction to your proposal carefully. Make sure it contains all the following rhetorical moves (but not necessarily in this order) that apply to your particular proposal:

- Define the subject. Make it clear to the reader what the topic will be.
- State the purpose of the document. The purpose of proposals is typically to request time and resources to study a problem, develop a new product, or investigate previously proposed solutions, etc.
- State the main point of the document. The main point is often to convince your reader (usually a supervisor or client) that the proposed project is deserving of approval. Be clear and concise about why you wrote the proposal and what action you want the reader to take.
- Stress the importance of studying this problem or implementing your solution. The importance may relate to the topic's urgency.
- Develop at least one brief motivating statement that will encourage the recipient to read on and to consider approving the project (especially if it is an unsolicited or competitive proposal).
- Forecast the organization of the proposal. Give an overview of the contents in the document.

Description of the Problem, Opportunity, or Situation

Often occurring just after the introduction, this section discusses what has brought about the need for the project—it introduces then states and discusses the problem—what problem, what opportunity exists for improving things, what the basic situation is. It is helpful to cover the 5 W's of the problem (*who, what, where, when*, and *why*). For example, management of a chain of daycare centers may need to ensure that all employees know CPR because of a new state mandate. You would explain the mandate, that all employees are not yet properly trained, and how this can affect child safety and state licensing.

Background of the Problem

You may also want to include background on the problem. While a known audience for the proposal may understand the problem very well, writing the background section is useful in demonstrating your particular view of the problem. In these cases, you can give background information as part of the description of the problem, the causes of the problem, previous solutions to the problem, and the consequences—both short and long term—of leaving the situation unaddressed. On the other hand, if the proposal is unsolicited, a separate background section is almost a requirement—you will need to convince the audience that the problem or opportunity exists, has urgency, and should be addressed in a timely manner.

Method and Procedure

In most proposals, you will need to explain how you will go about completing the proposed work. This acts as an additional persuasive element; it shows the audience you have a sound, thoughtful approach to the project. Also, it serves to demonstrate that you have the knowledge of the field to complete it. Often, the method and procedure section begins with several, tangibly stated research goals before being divided into three or more individual *phases*. For example, you might state that you want to "compare OSU's dining options to those of other universities" or "interview at least two professional experts in the field." The individual phases then outline how research will be performed as a way of creating a comprehensive approach to the topic. For each phase, you will identify the type of research you will perform and any critical details associated with it (e.g. Why is a certain database or website reliable? Who aggregates the information, and how long have they been doing so? Do they have an agenda? Or why was a certain person chosen to be interviewed? What can you disclose about their professional background that will convince the reader of your proposal that this is an appropriate person to interview and a good use of your time?). In addition to these major and minor details, you will also want to reveal the deliverables or outcomes expected and justify your research decisions.

Schedule

Most proposals contain a section that shows not only the projected completion date but also key milestones for the project. If you are doing a large project spreading over many months, the timeline would also show dates on which you would deliver progress reports. It is often helpful to *back plan* your schedule—work backwards from your due date to set important deadlines. If you cannot cite specific dates, cite amounts of time for each phase of the project.

Costs and Required Resources

Most proposals also contain a section detailing the costs of the project. With external projects, you may need to list your hourly rates, projected hours, costs of equipment and supplies, and so forth, and then calculate the total cost of the complete project. Internal projects, of course, are not free, so you should still list the project costs—hours you will need to complete the project, equipment and supplies you will be using, assistance from other people in the organization, and so on. These costs and resources are based on your needs to complete the research, not for implementing your solution—that information will appear in the report.

Benefits and Feasibility of the Proposed Project

Most proposals briefly discuss the advantages or benefits of completing the proposed project. This acts as a type of argument in favor of approving the project. There is little reason why your proposal should be accepted if there are no meaningful benefits. Thus, be sure to show that your solution will result in substantial benefits for the organization. Some proposals discuss the likelihood of the project's success. In an unsolicited proposal, this section is especially important—you are trying to sell the audience on the project, so your stated benefits should appeal to the reader's wants, needs, and values.

Conclusion

The final paragraph or section of the proposal should bring readers back to focus on the positive aspects of the project. In the final section, you can urge them to contact you to work out the details of the project (provide contact information, even if listed at the beginning of the document), remind them of the benefits of doing the project, and maybe make one last argument for you or your organization as the right choice for the project.

References

The reference page is a separate page where you list any and all source information used in your proposal, properly formatted, using a standard format in your field. List information sources— citations for specific books, articles, reference works, and other kinds of sources used in your report.

Proposal Design and Style

Your proposal should be visibly attractive, but also easy to read and follow standard format for the type of document used. The most important part of any proposal is for the reader to easily find the information they need to approve your project.

Most proposals follow a standard block format: one inch margins, single spaced text, skip one space between paragraphs, with no paragraph indentation. You also need headings and subheadings to identify and group areas of content and specific sections. The headings levels should contrast with one another while remaining consistent throughout the document. You may also have graphics in your report, which should be designed to create a consistent style with the text. Last, even though most of your proposal is formatted in block paragraphs, you still need to consider the major elements of design: contrast, repetition, alignment, and proximity (CRAP).

Proposals are written in a professional, but not bureaucratic, style. Think of this as a plain (non-literary) style, but with some appeal to emotion (pathos). Make sure you use terms that are easily understood by the audience and define terms where necessary. Be as clear and concise as possible.

A professional appearance is a basic requirement. If your document is less than professional, you can count on its prompt dismissal. There should be no errors in spelling or grammar, and all information should be concise, accurate, and clearly referenced when appropriate. Information that pertains to credibility should be easy to find and relevant—including contact information. If the document exists in a hard copy form, it should be printed on a letterhead. If the document is submitted in an electronic form, it should be in a file format that presents your document as you intended. Word processing files may have their formatting changed or adjusted based on factors you cannot control—like screen size—and information can shift out of place, which makes it difficult to understand. In this case, PDF format may be used to preserve content location and avoid any inadvertent format changes when it is displayed.

Attributions

25.

LITERATURE REVIEW IN HEALTH SCIENCES

by the Excelsior Online Writing Lab

The purpose of the literature review is to give you an overview of a particular topic. Your job in a Health Sciences literature review is to discover the research that has already been done, the major perspectives of researchers in the field, and the significant thinkers and writers, or experts, who have published on the topic you're interested in. In other words, it's a survey of what has been written and argued about your topic.

By the time you complete your literature review you should have written an essay that demonstrates your ability to do the following:

- Understand the history of what's been written and researched on your topic.
- Know the significance of the current academic thinking on your topic, including what the controversies are.
- Have a perspective about what work remains to be done on your topic.

Thus, a Health Sciences literature review synthesizes–or puts together in one place–your research into an explanation of what is known and what is not known on your topic. If the topic is one from which you want to embark on a major research project, doing a literature review will save you time and help you figure out where you might focus your attention so you don't duplicate research that has already been done.

Just to be clear: a literature review differs from a research paper in that a **literature review** is a summary and synthesis of the major arguments and thinking of experts on the topic you're investigating, whereas a **research paper** supports a position or an opinion you have developed yourself as a result of your own analysis of a topic.

Another advantage of doing a literature review is that it summarizes the intellectual discussion that has been going on over the decades–or centuries–on a specific topic and allows you to join in that conversation (what academics call academic discourse) from a knowledgeable position.

The following presentation will provide you with the basic steps to follow as you work to complete a literature review.

Step 1–Develop a Good Research Question

Think about this question as the question you hope to answer as you research. You may need to do some preliminary research and prewriting to help develop a good research question.

If you have already developed a strong research question as a part of the research and writing process, you are off to a great start!

Step 2–Identify Major Scholars or Text on Your Topic

Your professor and the librarians can help you get started.

Find out about the most important journals and/or books on your topic and look for some research there.

Journal articles can be the most helpful, as journals are where scholars in a field "talk" to each other, in a formal way, on key issues in their fields.

It can also be helpful to follow the references at the end of the important books or articles, which can lead to additional, credible resources.

Be sure your sources are current. This is especially important in fields like the sciences and the social sciences.

Step 3–Remember to Read and Think About Your Research As You Go

You need to understand what you are reading and all the different aspects of your topic and its thinkers. Some of the material may be dense and difficult to comprehend. Stop and read the articles you find, so you can begin to comprehend key points in the research on your topic.

As you continue and read more about your topic, you will grow in your understanding of the topic and begin to develop ideas to answer your research question.

As you read, you should annotate each source but also take notes about the main ideas of your sources. You should work to put the main ideas in your own words, as this will help bring you to a better understanding of the source and the overall topic.

You may also keep track of a few key quotes, but the goal will be to write down what you understand in your own language to help avoid issues with plagiarism.

For more information, see the **Note-Taking** area in the **Research** section or the Note-Taking & Plagiarism page in the **Avoiding Plagiarism** section of the Excelsior OWL.

Step 4–Take Careful Notes

As you read, you should annotate each source but also take notes about the main ideas of your sources. You should work to put the main ideas in your own words, as this will help bring you to a better understanding of the source and the overall topic.

You may also keep track of a few key quotes, but the goal will be to write down what you understand in your own language to help avoid issues with plagiarism.

Step 5 – Begin Drafting

NOTE: A literature review is an essay and should include a strong introduction, body paragraphs, and a conclusion.

GOAL: You should not only summarize your sources but make connections between the sources, identify major trends and controversies, and focus on your research question.

Your introduction should set up your literature review, and your conclusion might address what issues still need to be resolved or researched.

But, remember, the end of the research process for your literature review is not the end of your writing process. You should engage in strong revision and editing of your literature review, just like you would any other essay!

Attributions