



A Guide to Technical Communications: Strategies & Applications

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Lynn Hall & Leah Wahlin

Angela Burks, Yvonne Heather Burry, Jennifer L. Herman, Deborah Kuzawa

The Ohio State University



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Introduction



Welcome!

Welcome to the textbook for Engineering Technical Communications courses at The Ohio State University. Our aim in writing this textbook was to create a resource specifically focused on and applicable to the kinds of communication skills most beneficial to the students who take our courses. Therefore, this textbook focuses on developing both technical and professional communication skills and will help readers practice strategies for critically analyzing audiences and contexts, real-world applications of rhetorical principles, and skills for producing documents (reports, proposals, instructions), presentations, videos, and wide variety of other professional communications.

References

Header Image: "[Writing Tools](#)" by Pete O'Shea / CC BY

What is Technical Communications?

At its most basic, communication is the transmission of information in the form of words, images, and sounds. We string words, images, and sounds together to make meaning and to share that meaning with others. How we form the “strings” depends on audience and context. For instance, how we talk, text, or email our friends and personal acquaintances is usually different than how we communicate with our bosses or coworkers.

You might be asking yourself how a technical communications class is different from other academic writing classes. In a traditional academic setting, the writing classroom tends to be about the demonstration of knowledge—expanding on ideas or documenting an understanding of traditional types of papers or essays (explanatory, argumentative, reflective) with the audience being the instructor. In a technical communication classroom, many of the principles are similar—organizing paragraphs effectively, following the writing process—but with an increased focus on the professional context for communicating information and, therefore, even more emphasis on concision, clarity, and accessibility.

Ultimately, the goal of technical communication is to transmit important information as effectively and efficiently as possible—information that allows you and the people around you to do your jobs well.

The other way that technical communications might differ from your concept of a traditional writing class is that it is not limited only to “writing.” Part of transmitting information effectively is recognizing that we have many options for how we can communicate with our audiences. There are, of course, important written forms, such as reports, emails, proposals, and instructions, but you will also need to use visual and oral modes, such as presentations, videos, infographics, or diagrams. Further, web and social media offer professionals even more opportunities to communicate in a wide variety of formats. An effective communicator knows when and how to strategically deploy (or blend) these modes depending on audience and desired response.

The most important “strategy” emphasized in this textbook is that all communication must be designed with audience and purpose in mind. There are almost endless types of documents and forms of communication that will be at your disposal as a professional. In addition to knowing **what** you are communicating (the information, your expertise), you, the communicator, must thoughtfully consider **who** you are communicating to (your audience) and **why** you are communicating (the purpose).

Why is communication so important?

If you asked a professional to tell what they *really* spend their time doing, you might be surprised to learn that most of their workday is spent communicating. In a professional environment, communication becomes a thread that ties together your expertise, your duties, and your professional relationships. It allows you to first get a job and then perform your job well by fulfilling your duties, learning new skills, and maintaining good working relationships with your colleagues.

Sometimes incredibly knowledgeable people forget to consider the **who** and **why**, focusing only on the **what**, and this can lead to gaps in communication.

Imagine sitting in a lecture on particle physics when you don’t know an electron from a proton. The professor speaks rapidly and offers no pauses for questions from the classroom and assumes that every student, in every seat, is receiving and processing the lecture in the exact same way. As a student, you would feel lost and your focus would be on trying to keep up rather than assimilating any new knowledge on the subject. This professor, in assuming everyone had the same knowledge base, has caused a gap in communication because of a lack of audience awareness. One of the basic tenets of being an effective communicator is to know how to avoid these communication gaps. By understanding

an audience's makeup (education level, background knowledge, values, needs, etc.) and developing communication—in whatever form it may be—we can minimize the possibility of communication failure.

Engineers, especially, must be able to communicate within their teams and also be able to communicate complex information to a variety of audiences with different knowledge backgrounds. As Stephen Pinker (2014) explains,

The curse of knowledge is the single best explanation of why good people write bad prose. It simply doesn't occur to the writer that her readers don't know what she knows—that they haven't mastered the argot of her guild, can't divine the missing steps that seem too obvious to mention, have no way to visualize a scene that to her is as clear as day. And so the writer doesn't bother to explain the jargon, or spell out the logic, or supply the necessary detail.

Essentially, anyone who has developed a specific area of expertise needs to be mindful that not everyone around them knows the same information or even sees the world in the same way. Part of being an effective communicator means recognizing that the process of communicating information is dynamic and creative and being sensitive to your audience's needs and understanding.

Ultimately, the goal of this textbook is to help you develop the tools and critical thinking skills you need to be an effective communicator in your professional life. While we do address specific, common types of workplace documents, it is important to know that the types of communicating you will do in your professional life will evolve and change over time. For instance, people who began their careers in the 1980's likely did not consider email writing an important skill, but today it is one of the most-used genres of workplace communication. Whatever happens in the future, a nuanced, audience-focused communication strategy will allow you to evolve and thrive. This textbook is a foundation to help you develop an awareness of the adaptability of communication.

References

Pinker, S. (2014). The source of bad writing. The Wall Street Journal. Retrieved from <http://www.wsj.com/articles/the-cause-of-bad-writing-1411660188>

Rhetorical Foundations



Rhetorical Foundations

Structures, in order to stay standing, must be built on strong foundations. Like a building, communication must be built with a strong foundation in order to be effective. We build this foundation with an understanding of what Aristotle defined as the “available means of persuasion.” This next chapter offers some basic tools for building effective communications.

References

Header Image: [Untitled Photo](#) by bogitw / CC0

What is Rhetoric?

Rhetoric is the ancient art and science of persuasion, the study of persuasion, and the individual process of persuasion. Unfortunately, in the 21st century, rhetoric tends to be positioned as something separate from everyday communication. However, all human activities are rhetorical, whether or not we are conscious of it.

Rhetoric is about strategic choices and approaches to communication whether textually, verbally, or even aurally and visually. When we communicate to different types of audiences about the same topic, we make strategic decisions on what details to include or omit, what types of evidence or support to use, and so on. For example: let's imagine that your last weekend was filled with school work but mostly party-hopping and celebrations because your school's football team won the championship. When you speak to your best friend about your weekend, you are likely to provide details about how many parties you went to and what exactly you did at the parties, including gossip about mutual friends. When you speak to your grandmother about that same weekend, you might mention your study group meeting on Sunday afternoon, the take-out dinner you had on Friday night, and perhaps briefly mention that you celebrated the team's win with friends. When you speak to your supervisor at your on-campus job, you are likely to discuss the big football win (Go Team!), your looming exam schedule and how your study and exam schedule will impact your availability to work for the rest of the term. All versions of your weekend are accurate representations of your weekend, but you make strategic choices about which details to include or not include based on the particular **rhetorical situation** of your discussion. That is, how and what you communicate is shaped by:

- The writer, author, creator, also known as the **rhetor**
- The **audience**, including primary, secondary, and tertiary audiences
- The **topic** of the communication
- The **purpose**, which often can be broken into a primary, secondary, and tertiary purpose
- The **context** and **culture** within which the communication is taking place.

The context and culture impact the rest of the rhetorical situation (rhetor, audience, topic, purpose).

The three rhetorical appeals, as discussed by Aristotle are **ethos**, **pathos**, and **logos**. These three appeals are guided by **kairos**, which is about timing. The three appeals may be used alone, but arguments are most effective when they combine appeals to ethos, pathos, and logos, with strong grounding in kairos or timeliness.

ethos: a Greek word for character, ethos is an appeal to character, especially authority and expertise. Ethos is often mistaken as an appeal to ethics. Though ethics are an aspect of a person's or organization's ethos, ethics are not the only component of character, authority, or expertise.

Celebrity and other endorsements are often based on ethos. Ethos is why an American Dental Association endorsement of a toothpaste is more powerful and generally holds more sway than an endorsement from a non-medical professional. At the same time, though, ethos as it relates to advertising is a bit complex. Sometimes people or organizations will have strong ethos not because they are professionals in a given field (such as dentistry) but because they may they demonstrate the ideal results or benefits of a product.

Let's take Sofia Vergara, for example. Vergara is a popular actor due to her role on the sitcom Modern Family. Her ethos as one of the world's most beautiful people makes her an especially useful spokesperson for an array of personal care products, in part because she is known not only as an actor but as an attractive person. It is no surprise that she is a spokesperson for a variety of cosmetic and personal products, from Cover Girl makeup to [Head and Shoulders](#) shampoo. The latter product, though, is really where her ethos shines. Head and Shoulders is a dandruff shampoo, and generally, flaky scalp is not associated with beauty. By having Vergara star in Head and Shoulders'

commercials, and further, having Vergara happily admit that her family has been using Head and Shoulders for over 20 years, the company relies on Vergara's ethos as a confident, beautiful woman to combat embarrassment that some people (perhaps particularly women) may feel when faced with their own dandruff and flaky scalp and the need for a medicated shampoo. Vergara's emphasis on how long her family has used Head and Shoulders even suggests that perhaps some of Vergara's success in the beauty arena is due to Head and Shoulders.

pathos: originally, pathos described appeals to audiences' sensibilities. Modern uses of pathos generally means an appeal to emotions, both positive and negative. A rhetor may appeal to emotions that an audience already has about a subject, or a rhetor may elicit emotions.

The Emotions are all those feelings that so change men as to affect their judgements, and that are also attended by pain or pleasure. Such are anger, pity, fear and the like, with their opposites. We must arrange what we have to say about each of them under three heads. Take, for instance, the emotion of anger: here we must discover (1) what the state of mind of angry people is, (2) who the people are with whom they usually get angry, and (3) on what grounds they get angry with them. (Aristotle, 1378)

As Aristotle argues, emotions are central to our decision making, even if we are not consciously aware of it. If a rhetor desires to persuade a particular audience, then the rhetor must understand the ruling emotions regarding the topic and the specific audience. What makes the audience angry (or pleased), who or what is involved in producing or evoking that emotional state, and why does that particular audience become angry (or pleased) within a specific context? Knowing the answers to these questions will help a rhetor better prepare an argument and provide a basis for developing evidence and identifying counterarguments.

Pathos appeals can sometimes be overwhelming and dominate an argument because emotions in general can be overwhelming. When emotions are strong enough, they can overtake logic and reason. Political campaigns are excellent examples of pathos appeals. Political ads often play on the fears and hopes of different demographics. For example, a political ad focused aimed at retired and elderly voters may claim that a candidate plans on eliminating social support programs such as Medicare or will drastically cut Social Security benefits. These types of ads do not need to contain facts or evidence of such actions to be useful and successful because they rely on the fears and worries that the intended audience already has about financial and medical security.

Remember, pathos is about the emotional state of the audience, not the rhetor.

Logos: an appeal to logical reason, logos is about the clarity, consistency, and soundness of an argument, from the premise and structure to the evidence and support. A rhetor appeals to logos by making reasonable claims and supporting those claims with evidence, such as statistics, other data, and facts. However, Logical and reasonable arguments and evidence are not universal across audiences, contexts, cultures, and times. What an audience considers reasonable claims and adequate evidence is influenced by an audience's values and beliefs. Further, data and facts may evolve over time as we obtain more evidence, information, and data.

For example, some people believe the Federal Drug Administration is part of a conspiracy to cover up evidence that common vaccines cause a variety of neurological, psychological, and physical disorders, despite extensive scientific evidence from around the world that demonstrates common vaccines are safe. The scientific evidence is not reasonable or logical (and therefore not persuasive) for the conspiracy audience because the evidence may come from manufacturers of vaccines, FDA-sponsored studies, or researchers or studies with have connections to the FDA or other government agencies. However, for other audiences—such as those who are simply unsure about the actual benefits or reasons for vaccines—the same studies and data may be quite persuasive.

Kairos is the Greek word for time. In Greek mythology, Kairos (the youngest son of Zeus) was the god of opportunities. In rhetoric, kairos refers to the opportune moment, or appropriateness, for persuading a particular audience about a particular subject. Kairos depends on a strong awareness of rhetorical situation. Kairos is the where, why, and when of persuasion.

For example, nearly all op-eds and political essays are kairotic. The rhetors work to relate their ideas and messages to whatever is happening in the news and popular culture.

Applications in Technical Communications

Rhetoric teaches us that our communications must be shaped with an understanding of our intended audience and desired purpose. This is also true of technical communications. The goal of technical communications is to get information from Point A (the author/speaker) to Point B (the audience) as efficiently and effectively as possible. A strong rhetorical foundation helps facilitate that transmission.

Think back to the story in the introduction about the student in the physics lecture. In that scenario, the student (the audience) experienced a breakdown in the communication (lecture) being delivered by the teacher (the author). For the student, a lack of background knowledge meant not being able to keep up with the lecture. This lack of background knowledge is just one of the many factors that can cause gaps or roadblocks in understanding. Often, these gaps or roadblocks lead to miscommunication.



"Candyland" by Dave Parker / CC-BY

Here's another example: Did you ever play Candy Land as a kid? Candy Land is a children's board game where the objective is for players to race through the game to find the missing King Kandy and be the first to arrive at Candy Castle without getting stuck in any of the pitfalls (stay away from Molasses Swamp!) that would slow a player down and allow others to pass.

Think of the successful transmission of information like playing a game of Candy Land—your job as an effective communicator is to avoid the factors that cause your audience to get "stuck" on their way to understanding.

In professional and technical communication, it is important to remember your rhetorical foundation in order to minimize the possibility of gaps/roadblocks in order to ensure your information gets where you want it to go — you guessed it! — as efficiently and effectively as possible. Whether you are writing an email to a client, typing a memo

for your boss, or preparing a presentation, considering audience, purpose, and context as you draft will help you be an effective communicator and increase your professional ethos.

Job Search Communications



A number of complex communication situations arise during the process of searching for, applying to, interviewing for, and accepting a new internship or job. The stakes are high as you consider out how to position yourself as a professional in your field and it is deeply personal (you're trying to convince someone that you are a capable and qualified individual), so many people often feel unsure of themselves or nervous about this process.

As with any type of communication, these skills take practice and preparation, and the material in this chapter is designed to give you a chance to develop strategies that will help build your confidence through the hiring process:

- Reading and evaluating job postings
- Developing an excellent résumé and application letter
- Preparing for the interview and communicating after the interview

Focusing on communications and dynamics throughout the job search process also provides an opportunity to reflect on anti-discrimination laws in the United States and considering how those laws and the contemporary discourse about diversity in the workplace will play a role in your career.

Starting your career is a process of learning how to position yourself as a professional within your field, and much of that process relies on your ability to communicate effectively.

Preparing Job Application Materials

The following sections present a series of steps to guide you toward focused, personalized, and correct job application documents. Résumés and application (or cover) letters are common job documents, but our focus here is broader—we will ask you to consider the communication situation as a whole, from analyzing job postings to creating the documents as a dynamic process.

Your job materials are not forms to fill out, but strategic and persuasive communications that will need to be customized for each potential employer and at every phase in your career.

Starting the Job Search

The job search is more than finding a job posting for which you fulfill the requirements. This planning phase allows you to gather the information and language that you need to make yourself a strong applicant.

Know Yourself

As you begin the process of finding and applying for employment in your chosen field, it is important to take stock of your education, technical skills, and the experiences and characteristics that make you an ideal employee and co-worker. This self-assessment is the foundation for building strong job materials.

Beyond evaluating your skill set, this is also an opportunity to take stock of the types of environments you will thrive in:

Do you work better independently or in groups?

Have you always imagined working for a large company, with the structure and perks that offers? Or do you see yourself working on a smaller team, perhaps taking risks for a project you believe in personally?

Do you like developing new ideas and planning? Do you like seeing through a complex project to the finish?

Use this information as you search for potential jobs and internships and evaluate employers. Seeking out a work environment and job that suits your strengths and preferences will give you an advantage in the job search and in your career.

Know Your Field

Use the resources available to you (career services, job websites, networking events) to find positions. Go to career fairs and make connections. Even before you are truly “on the market” career fairs and networking events are great ways to build your confidence and become comfortable in professional environments.

You will find Job Search Tools/Resources from OSU’s Engineering Career Services [here](#). Students in other colleges and disciplines will be able to find similar career services information online as well.

Keep yourself informed and up-to-date on the projects and initiatives happening within your chosen field and especially of those employers that most interest you. This is not something you only do the night before a career fair or an interview – expose yourself to these ideas and discussions over a long period of time. These types of resources are a great place to get started:

- **Organizations and conferences.** Connecting with and simply being aware of the national organizations will expose you to current ideas and developments in the field. Most host conferences on a regular basis and

even just reading the Call for Presentations or the titles and abstracts from a recent conference will introduce you to new terms and concepts, laying groundwork for future learning or research.

- **Company blogs or white papers.** Most companies “talk to” the public or the industry in some way to manage public perception, promote accomplishments, and (often) recruit employees. These might be highly technical or more casual or promotional in tone, depending on the company culture, industry, and their goals – any of these provide valuable insights.
- **Social media.** Following both companies and individual professionals will introduce you to their work, concerns, and developments in the industry. It also might make it easy for you to get exposed to these ideas as part of your regular online habits.
- **Local networking or meetup groups.** Professionals often hold events at a local level to meet each other and learn about what other companies in the area are doing. These might be purely social or they might include learning opportunities in the form of talks and presentations. On campus, you will also find a variety of discipline-specific groups and students organizations that can also expose you to new ideas and resources, not to mention great professional connections.

Build a vocabulary! Part of what you are doing as you prepare yourself for your career is learning a language – you are developing vocabulary and learning the language of your profession in addition to developing the required technical skills.

In the process of completing the self-assessment, you probably discovered that you have lots of skills and strengths seemingly unrelated to your field. It’s important to remember that even unrelated experiences have taught you “transferable skills” – skills that may not be technically related, but are considered important to any field.

These “soft” skills are consistently ranked high on employer lists of desired attributes and include organizational skills, leadership abilities, teamwork experience, communication skills, problem solving, meeting deadlines, and so on. In the job search process, it is important to be able to describe your previous experiences in language that employers recognize as valuable.

Organization Management & Leadership	Research & Planning	Communication	Interpersonal	Other
Initiating new ideas Coordinating tasks Being detail-oriented Managing or directing teams or groups Coaching Selling ideas or products Decision-making Managing conflicts or problems Managing budgets	Forecasting Coming up with ideas Identifying problems Developing solutions Solving problems Imagining alternatives Gathering information Analyzing and evaluating information Setting goals Defining needs and requirements	Speaking effectively Writing concisely Listening attentively Facilitating group discussion Providing appropriate feedback Being tactful Negotiating Persuading Interviewing Editing	Being sensitive to feelings and moods of others Listening Developing rapport Providing support Motivating Negotiating Sharing credit Teaching/ training Delegating Cooperating; working with a team	Managing time effectively Setting and meeting goals Being a self-starter; self-motivated Working independently Enlisting help when needed Meeting deadlines Being diligent; tenacity to get the job done; follow-through Being responsible and reliable

Think & Write: After reviewing the transferable skills outlined above, spend some time thinking about any experiences (academic, extracurricular, job-related, etc.) you have had in which you demonstrated, practiced, or developed one or more of these skills. Select one, and, in a paragraph, describe what the specific experience was, explaining which skills you demonstrated and developed.

Designing an Effective Résumé

A *résumé*, from the French word for “summary,” is a concise, standardized document that introduces you as a professional, most often for the purposes of seeking employment, but it also useful in other situations, such as applying for awards or seeking a promotion. It is likely a document you are already somewhat familiar with and you might even already have a *résumé* of your own, but learning how to strategically and confidently build a *résumé* for a particular audience and purpose is a vital professional communication skill. It is more than a list of jobs – it is a prioritized, condensed introduction to you, the job applicant, and it demands close attention.

Note: The practices for this document outline here are focused on business culture and norms in the United States, so keep in mind that you will need to research and follow the appropriate standards if you’re applying for positions internationally.

To understand everything else that follows in this section, it is important to first consider the rhetorical situation for this particular type of communication. *What is the intended effect? What are you trying to accomplish? Who is your audience? How will they be accessing and reading your document?*

AUDIENCE	PURPOSE
Employer or representative of an employer Seeking potential employees Evaluating a pool of applicants to see if they are qualified, looking for a reason to say yes or no Likely reviewing a set of résumés	Demonstrate that you possess the qualifications for the position (or award or promotion) Document your qualifications, experience, and work history Fulfill obligation to produce a standard employment document

Each decision you make about what to include in your résumé and how it should look should be made with these factors in mind, plus more, based on your knowledge of the specific employer or position.

Key Takeaways

Here are four basic rules regarding how to approach writing your résumé:

1. **Create multiple versions.** A résumé should be customized to the specific job you are applying for and adapted based on your knowledge of the employer. You should also consider how you will be submitting the document to determine the best formatting (See more about designed résumés vs. ATS résumés).
2. **Learn the conventions of your discipline.** Not every professional context is the same – it is invaluable for you to have someone in the field or even the specific company to which you are applying review your résumé. An engineer’s résumé will likely look very different from a designer’s résumé simply based on the audience’s expectations.
3. **Update on a regular basis.** Even if you expect to stay in a job in the long term, take notes and gather information for your résumé every couple of months or after you finish a major project. It’s difficult to remember the details of a complex project after the fact, so having that information documented is a huge asset.
4. **Eliminate errors from the document.** Because the résumé is condensed (a single page for undergraduate students) and since it is used to evaluate you as a potential employee, there is little tolerance for typos or errors. Check grammar, spelling, design consistency, punctuation, and language. Then check it again and ask a friend to review it. And then again.

What to Include in Your Résumé

The content in your résumé should be carefully selected to present the best, most applicable qualifications for a particular employer (the company and position for which you are applying) or purpose (attending a career fair).

Here are the basic types of information that you will select from as you build your résumé:

As you are planning what content will be included in your résumé, know that information placed at the top of the document typically has the most impact. That’s why Education is almost always one of the first sections, since the first requirement in an internship posting is typically your year in school, major, and GPA. As you move down the page, though, lead with the most relevant, interesting sections, and organize the content to feature the experiences and skills that this employer will most value.

You will have many questions about what you should and should not do as you are compiling and revising your résumé. You can try to find answers to these questions online, but once you know the basics, ultimately, you will need to make your own choices about the best way to present your qualifications.

If you are wondering whether or not to include a piece of information, focus on the audience’s needs. *Will they find this information valuable in making a decision about you as a candidate? Does it reveal something important about your skills, interests, and qualifications? Does it reveal something new about you that is not already revealed in the document?*

If you are wondering how to present a piece of information, know that the options are endless, but, again, you will want to focus on the audience. *Is the content presented in a way that is easy to see and understand? Is it logically connected to the information around it?*

Be confident as you make these decisions. There are fewer “rules” than you might think—the challenge is to create a document that is not just correct, but one that strategically reveals you as a candidate for a job and an individual. You don’t want your résumé to look like a form or to be exactly like everyone else’s. Look for ways to include those things that express your personality and passion—the things that make you unique.

Visual Design Considerations

The content and language in your résumé, as discussed in the previous section, is the first priority, as you figure out how to explain your experiences and show the employer that you meet the requirements for the position. The visual design of your résumé—the way the information is presented on the page—also deserves some careful planning and consideration because it has an impact on the way your audience will be able to read and understand the information.

Recall that your reader (e.g., an HR representative, a campus recruiter) might be reviewing many résumés in a row and perhaps reviewing them quickly. An effective visual design can help ensure that your résumé is accessible and that it makes a good impression, which will make them more likely to consider you a strong candidate!

Reflection & Discussion: Consider how the design of the résumé below affects you as a reader. How does your eye travel down the page? How would it make you feel about the job applicant’s qualifications?

Key Takeaways

Here are some simple things to keep in mind as you are finalizing the design of your résumé (the example résumé above demonstrates many of these attributes for your reference):

- **Clear headings.** Content needs to be categorized visually, with main section headings (e.g., Work Experience) and subheadings. Font size and type help visually organize the text on the page. All caps and bold are your best options for emphasizing headings and subheadings; italics and underlining are more difficult to read and should be used less often.
- **White space.** A résumé that is full of dense blocks of text becomes difficult to read. Our eyes need white space to help us understand how information is connected and how it relates to the content around it. Add space above headings and subheadings. Don't use unnecessary lines or embellishments—white space is often more effective.
- **Balance.** White space may be a helpful organizing principle, but you want to avoid too much white space or empty spaces on the page. Adjust the length of lines or the layout to ensure that each “quadrant” of the document has a roughly equal amount of content. The most common issue is a large “channel” of white space down the right side of the page.
- **Vertical alignment.** To keep a document visually organized, similar headings and elements (e.g., a bulleted list) should fall along the same vertical line—if you drew a straight line from the top of the page to the bottom, all the bullets would fall along the line, for instance. This keeps the document clear and organized (compare the example in the previous section with the “needs improvement” résumé below).
- **Coherence and consistency.** The same types of information (e.g., company name, dates) should be presented in the same way—same text formatting, positioning in the section. This helps “train” the reader's eye, making sure they know where and how to find the information.
- **Fonts and typography.** To ensure that your résumé displays correctly and is compatible with Applicant Tracking Software (ATS), it's best to use a common, standard, and professional font (Arial, Times New Roman, Tahoma). However, you can use more than one font—a serif font works well for headings alongside sans-serif fonts for body text.

Student Lastname

Lastname.xx@buckeyemail.osu.edu - 100 Your Ave. – Columbus, Ohio 43201-(555)-555-5555

Objective

Seeking mechanical engineering internship for the Summer of 2014

Education and Honors

- A current sophomore at The Ohio State University in Columbus, Ohio
- Majoring in Mechanical Engineering
- Graduated with honors and a 3.75 GPA (4.0 scale) from Your High School

Work Experience

Sometown Repair Services – 2012- Present

- Traveled with service technicians to work at different job sites (residential and commercial)
- Dissembled appliances to bring the copper and scrap metal to the scrap yard for cash
- Worked inventory inside the office
- Shadowed my boss during several of his meetings on job sites with other engineers to gain experience

Leadership Experience

National Honor Society

August 2010 – May 2013

- Sponsored and performed community service project
- Required to maintain a 3.5 GPA
- Held school events

Yourtown Athletics Committee (August 2010 – May 2013)

- 1 of 5 students throughout a high school of 2100 kids to be selected for a committee
- Presented opposing teams with a warming gift in their locker warm, such as candy

*Common Questions***What if I've never had a job?**

As a student, work experience is only one part of the picture when it comes to presenting yourself as a candidate, but it is a common concern. It is useful because it shows that you have held the responsibility of a job—that you are reliable, responsible, can work well with others. So, if you do not have a paid work experience, think about how you can argue that you have those skills and abilities. Do you have volunteer experiences or activities that reflect your ability to work hard and be responsible? Do you have project experience that shows your ability to execute a complex group project and collaborate with a group? Don't worry about the experience you don't have; focus on making the most out of the experiences you do have.

What if my GPA isn't as high as I'd like it to be?

A low GPA can seem like an insurmountable challenge in a world of job postings that focus so much on minimum GPA, but don't let it hold you back. First, consider how you present your GPA—if your major GPA is higher or if your GPA after your first year is higher, feature that on your résumé (as long as you do it honestly and accurately). Second, emphasize the positive—did you have a low GPA because you were in a major that didn't align with your skills, but now you have refocused? Are you gaining valuable experiences, being self-motivated to learn and try new things? Highlight those things. Third, give yourself opportunities to meet recruiters (at job fairs or events) and be ready to talk about your GPA. If it's not as high as you'd like it to be, what are you doing to fix that? What have you learned from the experience? What do you want to accomplish?

If I have attended another university, how do I show that on my résumé?

You will list any schools from which you earned a degree, with the most recent on the top. So, even if you are a transfer student and earned credits at another institution, you will only list the school that will award your final degree. If you want to explain that you attended another school in your application letter or during the interview, that is your choice, but it is not required on the résumé.

Should I list my high school?

After your sophomore year in college, do not include your high school information. Since you are a university student, it's assumed that you have earned a high school (or equivalent) diploma, and you will want to focus on filling the page with more recent experiences relevant to your major. However, if you have a significant experience from your time in high school that illustrates your skills and qualifications, don't hesitate to include that—you will just not list your high school diploma under "Education."

Writing the Application Letter

Traditionally, the application letter or cover letter is a formal letter that accompanies your résumé when you apply for

Should I include references on my résumé?

Unless specified otherwise by the employer, do not put references on your résumé—you need to fill the space with more important information. You should keep a separate list of references to provide upon request. Remember to ask permission to list someone as a reference and always send a courteous alert to let them know who you have given their information to and why (this will also help them be better prepared to give you an excellent reference).

a position. Its purpose is to support your résumé, providing more specific details, and to explain in writing why you are a strong candidate for the specific position to which you are applying. It should not simply reiterate your résumé; it’s an opportunity for you to make a case for your candidacy in complete sentences and phrases, which gives the reader a better sense of your “voice.”

As always, it’s helpful to start by first thinking about the audience and purpose for the application letter. *What information does your reader need to glean from your letter? At what point in the hiring process will they be reading it?*

AUDIENCE	PURPOSE
Specific (named) employer for a specific position Gets a sense of your “voice” and your interest through your writing—you are talking directly to the reader	State your intention to apply for the position Explain why you are a good candidate by describing your experiences and demonstrating your skills (go beyond the résumé) Display knowledge of and interest in this specific employer/job Produce a high quality piece of writing (proving that you have the ability)

As you draft the letter, consider what you would want to say if you were sitting across the desk from your reader. It should be written in a formal, professional tone, but you still want it to flow like natural speech—this will make it easier for your reader to absorb the information quickly.

What to Include in the Application Letter

It can be helpful to think about writing the application letter in sections or “blocks.” This provides a basic structure for the letter; once you have an understanding of this foundation, you can customize, update, and personalize the letter for different applications and employers.

Introductory Paragraph

Open the letter with a concise, functional, and personable introduction to you as a job candidate. This is your chance to establish the essential basics of your qualifications and to set the themes and tone for the rest of the letter.

- Name the position you’re interested in (by exact name and number, if available), and where you heard about it
- Clearly state that you are applying for the position—remember that you are requesting (not demanding) that they consider you as a candidate for the position
- Identify your major, year or graduation date, and school (this should be a brief preview of your educational status/area—you will go into more detail in the Education paragraph)
- Create a theme (essentially a thesis statement) for the letter, based on the job requirements and your knowledge of the employer (this may not be possible until you write the other paragraphs, so save it for last)

→ NOTE: Once you have established the thesis (the key reasons for your qualifications), keep in mind that the remaining paragraphs must specifically “prove” or “show” that you possess these qualifications

Optionally, you might also take the opportunity at the beginning of the letter to express your interest in working for this particular company and/or your passion for and interest in the field—I am particularly interested in this position because... This sets a nice tone and shows that you are engaged and enthusiastic. It is also an opportunity to demonstrate your knowledge about the employer and what they do (developed through your research).

Education & Academics Paragraph(s)

Since you will have already stated your basic educational status (major/year/school) in the introductory paragraph, the purpose of this paragraph is to paint a more detailed picture of you as a student, making progress in your academic program and gaining valuable experiences along the way. Your opportunity in this paragraph is to describe your academic progress in more specific detail, explaining the activities and knowledge you are developing that most matter for this position and employer. Carefully consider what the employer will value most about your educational experiences.

- Emphasize specific skills and knowledge that you are developing
- Describe significant coursework or projects—don’t be afraid to focus in on a particularly compelling example or experience

If you have a lot of project experience or several key experiences that you want to highlight, this information may be written in multiple paragraphs.

This content should NOT be a laundry list of course titles. Instead, describe how your academics have shaped your understanding of the field you are entering and significant skills you are developing, but always tie it back to what the employer is looking for—stay focused on the information your audience needs and what they will care about.

Employment Paragraph (if applicable)

It is important for employers to feel that they are hiring responsible, reliable people who know how to hold down a job. If you do have work experience in this field such as a previous internship, this is a perfect time to discuss that. If you have previous work experience, even if it’s not related to your field, this is your opportunity to describe the value of that experience—the value for you, but, more importantly, to your reader.

- Describe your previous work experience (show, don’t tell that you’re a good employee)
- Be specific about the company, the time frame, your responsibilities, actions and the outcomes/results
- Focus on relevant and transferable skills developed on the job

Activities Paragraph (if applicable)

Activities and involvement in things outside of your coursework and work experiences such as student organizations, clubs, and volunteer work are a great way to show that you are a well-rounded, motivated person with good time management skills. Personal, human connections are an important part of the job application process, and describing some of these activities and interests can help your reader start to feel a more personal connection.

- Demonstrate personality, values, and transferable skills through sports, volunteer, travel or other professional experiences
- Describe your specific actions and involvement honestly, while still trying to connect to transferable skills and the keywords in the job posting

If the employer has a strong program for charitable giving and involvement in an area that you share an interesting, that would be another opportunity to build a connection with them and show that you could embrace the company culture and values.

Concluding paragraph

As you conclude the letter, you will want to tie everything together, acknowledge the next steps, and end on a positive note.

- Reference your resume (“You will find additional information on my résumé”)
- Request (don’t demand) an interview (“I would appreciate the opportunity to meet with to learn more about the position and discuss my application”)
- Provide contact information in the paragraph (phone number and email address)—don’t put this below your name
- Reiterate interest in the position, the employer—another opportunity to demonstrate your knowledge about the company

A Note About Topic Sentences

As you reinforce the main idea or purpose of the letter (that you have the necessary skills, qualifications, and temperament for the job), make sure you prioritize what your reader needs to know about you and that all of the experiences you describe are meaningful to them. One good way to do that is to focus on how you construct the topic sentences. The first sentence in each paragraph should clearly explain the purpose of the information contained in that paragraph.

Begin each paragraph with a statement that connects your experience to the employer’s requirements and desired qualifications.

Topic Sentence = My experience + Why it matters

Consider how the following examples were revised to focus more on the value of the experience to the employer rather than simply stating the information about the experience.

EXAMPLE 1:

- Original: During the past three summers, I worked at Ray’s diner in my hometown.
- Revised: Working at Ray’s diner in my hometown for the past three summers has taught me a lot about responsibility and reliability.

EXAMPLE 2:

- Original: During my freshman year, I was part of an Alternative Energy Vehicle project group.
- Revised: I gained first hand experience with collaborative problem solving and project management while working on an Alternative Energy Vehicle project during my freshman year.

The revised versions explicitly connect the experience (working at the diner, being on a project team) with the value and lessons learned, making it easier for your reader to understand, even while reading quickly, how this supports your qualifications.

Letter Formatting Considerations

Your application letter should use formal letter formatting. You will find detailed information about the required elements of a letter document [here](#) and more information about writing cover letters [here](#) (both are from Purdue’s Online Writing Lab).

In today’s job market, where many applications are online, the letter might be delivered in a variety of different

formats. For example, it might be a PDF file uploaded to an online application system or it might be simply sent in the body of an email. In any case, consider the following as you decide how to format the letter:

- If you are delivering it as a stand alone file or an attachment, use a formal letter format and save it out as a PDF (unless otherwise instructed).
- If you are sending the application letter content directly in the body of an email, you do NOT typically need to include the sender's (your) address, the date, or the recipient/inside address. You would begin the email with the greeting.

NOTE: Carefully follow all instructions for any job application process or ask to confirm how the materials should be delivered. It is possible, for instance, that a company would want you to send your application letter via email as an attachment—it just depends on how the company processes applications.

Career Portfolios

The word portfolio, by definition, is “a case or stiff folder for holding papers, prints, drawings, maps, etc.” and “a collection of samples of a person’s work, typically intended to convey the quality and breadth of his or her achievement in a particular field” (OED, n.d.). Though the word can be traced to 16th century Italy, its Latin roots (*portare* “to carry” + *folium* “leaf”) date back even further.

A career portfolio—whether a physical or electronic version—is a place for gathering and maintaining documents important to your career. Think of it as a dynamic, expanded version of your résumé where you document and demonstrate your education, experience, and skillset. Where résumés and application letters are limited due to their genre-specific natures, the career portfolio can contain anything you want prospective employers to see. However, this does not mean that it should contain everything. It’s important to be selective and to think rhetorically about the items you choose to include.

As you gather documents, consider your chosen field. What do employers in the field find valuable? What skills and abilities do employers in the field expect employees to have? For instance, mechanical engineers might be expected to have design experience, project management experience, and effective communication skills. It might benefit a mechanical engineer, then, to include any schematics they have created, a strong project plan, and a writing sample or slide deck to document communication skills. Keep and maintain artifacts that showcase your strengths.

Portfolios can be either electronic or physical. A physical portfolio should be kept in an attractive , though electronic is easier to distribute and can be linked to on your résumé and LinkedIn profile.

Interview Strategies

Engaging With Research



If we just start writing here, how does it look? Do we need to start each section with a heading?

Common Types of Research Reports & Documents

Lab reports, recommendation reports, proposals, and white papers are just some of the professional documents that often rely on research.

Another hotspot:

Strategies for Conducting Research

In the 21st century, we have more information and knowledge instantaneously at our fingertips than could have been imagined 100, 50, or even 30 years ago. Figuring out how to wade through all of that information can be daunting. Research is one way we can make sense of and talk about all the information available to us. Research is the basis for strong and persuasive arguments because it helps us understand what others have said, done, and written about a particular topic or issue.

What is research?

Before you begin to find sources, you must determine what your questions are or what you hope to learn. Do you want first-person reflections and commentary? Statistics and facts? News reports? Scientific analyses? History?

For example, if you are interested in a recent piece of legislation then you would want to locate the full-text of the bill as well as commentary about the legislation from reliable news organizations such as The Wall Street Journal or The New York Times. If you are interested in statistics about the U.S. population, you might go to the U.S. Census Bureau or the Pew Research Center. Perhaps you are interested in the experiences of veterans returning from active duty. In this case you may turn to blogs or op-eds written by vets, official U.S. military records from agencies such as the Department of Defense, Department of Veterans' Affairs, or organizations such as the RAND Corporation.

Primary v. Secondary Research

There are two basic kinds of research—primary and secondary. Often, primary and secondary research are used together.

Primary research is often first-person accounts and can be useful when you are researching a local issue that may not have been addressed previously and/or have little published research available. You may also use primary research to supplement, confirm, or challenge national or regional trends with local information. Primary research can include:

- Interviews
- Surveys
- Questionnaires
- Observations and analysis
- Ethnography (the study and description of people, cultures, and customs)

Secondary research is what many students are most familiar with as it generally requires searching libraries and other research institutions' holdings. Secondary research requires that you read others' published studies and research in order to learn more about your topic, determine what others have written and said, and then develop a conclusion about your ideas on the topic, in light of what others have done and said. Some examples of source types that might be used in secondary research include:

- Academic, scientific, and technical journal articles
- Governmental reports
- Raw data and statistics
- Trade and professional organization data

- Primary and secondary research often work together to develop persuasive arguments.

For example...some kind of example.

Where do I begin?

Research is all about questions. In the beginning the questions are focused on helping you determine a topic and types of information and sources; later in the research process, the questions are focused on expanding and supporting your ideas and claims as well as helping you stay focused on the specific rhetorical situation of your project.

Questions to get started

What is my timeline for the project? You will likely want to set personal deadlines in addition to your instructor's deadlines.

What do I want to know or learn about? This helps you determine scope or the limits of your research. If you're writing a dissertation or thesis, then your scope will generally be larger because those types of projects are often 100+ pages. For a term paper, the scope will be more narrow. For example, if you're interested in NASA funding and research, you may limit yourself to the past 10-15 years because NASA has been around for nearly 60 years. Further, you may limit your focus to research that has transitioned into technologies or resources used outside of NASA and the space program.

What do I already know about this topic?

What biases might I have about this topic? How might I combat these biases?

Questions to determine methodology

Where might I find useful, reliable information about this topic? For academic research, you will generally focus on library, technical, scientific, and governmental resources. It is fine if you are not quite sure exactly where you should look; your instructor should be able to help you determine some places that would be appropriate.

Will I need to perform primary research, secondary research, or both?

Next you will have to develop a research question. By this point you should have a general idea of your topic and some general ideas of where you might find this information. Research questions generally form the basis for your project's thesis. Research questions are not about facts (i.e. Q: How much is NASA's 2016 budget? A:~\$19.3 billion) but about opinions, ideas, or concerns (i.e. What is the impact of NASA's budget on scientific breakthroughs and contributions to non-space-related fields?). The former can be answered quickly and easily whereas the second question requires detailed analysis of multiple sources and considerations of various opinions and facts.

Where do I look?

In the 21st century, we generally turn to the internet when we have a question. For technical, scientific, and academic research, we can still turn to the internet, but where we visit changes. We will discuss a few different places where you can perform research including Google, Google Scholar, and your university library website.

Google and Google Scholar

The default research site for most students tends to be Google. Google can be a great starting place for a variety of research. You can use Google to find news articles and other popular sources such as magazine articles and blog posts. You can use Google to discover keywords, alternative terms, and relevant professional, for-profit, and non-profits business and organizations. The most important thing to remember about using Google is that search results are organized by popularity, not by accuracy. [[Further, because Google customizes search results based on a user's search history, searches performed by different people or on different browsers may provide slightly different results.]]

However, for many technical, scientific, and scholarly topics, Google will not provide access to the appropriate and necessary types of sources and information. Google Scholar, however, searches only academic and scientific journals, books, patents, and governmental and legal documents. This means the results will be more technical and scholarly and therefore more appropriate for much of the research you will be expected to perform as a student.

[NEED FORMAT] [[Though Google Scholar will show academic and technical results, that does not mean that you will have access to the full-text documents. Many of the sources that appear on Google Scholar are from databases, publishers, or libraries, which means that they are often behind paywalls or password-protected. In many cases, this means you will have to turn to a university or other library for access.]]

University Libraries

Library resources such as databases, peer-reviewed journals, and books are generally the best bet for accurate and more technical information. A Google search might yield millions and millions of results and a Google Scholar search may yield tens or hundreds of thousands of results, but a library search will generally turn up only a couple thousands, hundreds, or even dozens of results. You may think, “Isn’t fewer results a bad thing? Doesn’t that mean limiting the possibilities for the project?” The quick answers are yes, fewer results means fewer options for your project, but no, this does not mean using the library limits the possibilities for a project.

Overall, library resources are more tightly controlled and vetted. Anyone can create a blog or website and post information, regardless of the accuracy or usefulness of the information. Library resources, in contrast, have generally gone through rigorous processes and revisions before publication. For example, academic and scientific journals generally have a review system in place, whether a peer-review process or an editorial board—both feature panels of people with expertise in the areas under consideration. Publishers for books also feature editorial boards who determine the usefulness and accuracy of information. Of course this does not mean that every peer-reviewed journal article or book is 100% accurate and useful all of the time. Biases still exist, and many commonly accepted facts change over time with more research and analysis. Overall the process for these types of publications require that multiple people read and comment on the work, providing some checks and balances that are not present for general internet sources.

So what are common types of library sources?

- **Databases:** databases are specialized search service that provide access to sources such as academic and scientific journals, newspapers, and magazines. An example of a database would be Academic Search Complete.
- **Journals:** journals are specialized publications focused on an often narrow topic or field. For example, *Computers & Composition* is a peer-reviewed journal focused on the intersection of computers, technology, and composition (i.e. writing) classrooms. Another example is the *Journal of Bioengineering & Biomedical Science*.
- **Books:** also called monographs, books generally cover topics in more depth than can be done in a journal article. Sometimes books will contain contributions from multiple authors, with each chapter authored separately.
- **Various media:** depending on the library, you may have access to a range of media, including documentaries, videos, audio recordings, and more. Some libraries offer streaming media that you can watch directly on the library website without having to download any files.

How do I perform a search?

Research is not a linear process. Research requires a back and forth between sources, your ideas and analysis, and the rhetorical situation for your research.

The research process is a bit like an eye exam. The doctor makes a best guess for the most appropriate lens strength, and then adjusts the lenses from there. Sometimes the first option is the best and most appropriate; sometimes it takes a few tries with several different options before finding the best one for you and your situation.

Once you decide on a general topic, you will need to determine keywords that you can use to search different resources. Let's say you read about the How 4 Mexican immigrants and their cheap robot beat MIT in a robotics competition, and now you are interested in the topic of immigration and STEM education or employment. After reading the article, you decide on some terms:

- Illegal aliens
- Hispanics
- STEM
- Education
- Employment

It is important to have a wide range of keywords because not all terms will result in the same information. Developing a list of keywords can be aided by a quick Google search. A Google search may reveal more official language or terms; broader or narrower terms and concepts; or related terms and concepts. You can also search for the term + synonym to find other words you might use.

NB: A synonym search will not work for all terms. For technical and scientific topics, though, Google may not be a lot of help for finding other terms.

Further, you can use a couple different tricks to narrow your search. Using quotation marks around two or more words means the search results will contain those words only in that specific order. For example, a search for "illegal aliens" would only provide results where these words appear in this exact order, with no words between them. A search for illegal aliens without the quotation marks will search for "illegal aliens" but also any sources that have the word illegal and alien anywhere in the text.

Writing about Research

Using and Documenting Sources