Tackling Wicked Problems

Tackling Wicked Problems

An OER for Students at PSU

MEMBERS OF THE TWP COMMUNITY



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This book is an Open Educational Resource (OER) designed specifically for you, a Plymouth State University student enrolled in the "Tackling a Wicked Problem" course. The book contains material written specifically for it as well as material from other openly licensed material including the OER written by the Fall 2017 First Year Seminar Fellows at Plymouth State University. That earlier OER was designed specifically for Plymouth State University's First Year Seminar and can be found here:

https://psufys.pressbooks.com

"Tackling a Wicked Problem" is the first course you will take in which you will engage in PSU's Integrated Cluster model of education. This project-based course is required of all students entering the University with fewer than 24 credits and is designed to be an introduction to the kind of work students will engage in during their time at PSU. The course provides opportunities for you to understand and begin to develop the Habits of Mind that PSU faculty, staff, and alumni feel are most important to your success both during and after college.

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TACKLING WICKED PROBLEMS

The chapter called "What is Tackling a Wicked Problem?" discusses the course and what it is all about. The chapter called "What is a Wicked Problem?" describes the characteristic of wicked problems, which are the kinds of problems that this course focuses on.

A wicked problem is a problem, usually social or cultural, that is challenging or impossible to solve either because not enough is understood about the problem, the number of stakeholders involved, the number of varying opinions, the economic burden, or the impact of these problems with other problems. For example, poverty is closely related to education, health, and nutrition.

Horst Rittel has cited ten characteristics of these hard-to-solve social and cultural issues:

1. Wicked problems are hard to define and neatly categorize. Poverty is different in Concord, New Hampshire than in urban China. Therefore, "poverty" is not the same everywhere.
2. Because wicked problems are hard to define and melt into each other, they are also hard to declare "solved." It's too difficult to measure success.
3. There are no "solutions" to wicked problems, only "good" or "bad" measures. Since it's hard to define an end goal to a wicked problem, it's more productive to focus on trying to improve a situation, rather than attempt to solve it.
4. There are no standard approaches to wicked problems. The problem of each situation is unique and requires its own approach that is often developed on the fly. Every wicked problem is unique.
5. Explanations for wicked problems vary because no single observer can claim to have fully analyzed and understood the full scope of the problem.
6. Wicked problems are the results of other wicked problems. Addressing one problem may result in improving the situation for other wicked problems. For example, improving education will have positive implications on health, nutrition and family planning. On the other hand, addressing one problem may result in other problems getting worse. For example, building low-income housing to address homelessness issues may result in high unemployment rates in concentrated areas.
7. There is no definitive scientific test for the solution of a wicked problem because they are human caused and not natural phenomena.
8. Attempts at solutions are often small-scale because too much new understanding during the process often reveals new information that changes the approach.
9. Every wicked problem is unique so attempts to solve one wicked problem are difficult to adapt to other wicked problems.
10. Designers attempting to address a wicked problem must be fully responsible for their actions.

Not every hard-to-solve problem is a wicked problem, though most social problems are wicked. Wicked problems can't be "fixed". Approaches should be focused on how to best mitigate their immediate impact. Finally, wicked problems require an interdisciplinary approach with an understanding that no quick result will be forthcoming. Addressing wicked problems is time-consuming and iterative, requiring long-term dedication.

The above information came from: https://www.wickedproblems.com/1_wicked_problems.php

During your first year at Plymouth State University, you and all first year students who transfer in fewer than 24 credits take "Tackling a Wicked Problem" (TWP), the course in which you are currently enrolled. This is a single semester course that introduces you to Plymouth State University's educational model focused on collaboratively creating projects that reach beyond the walls of the classroom in some way. In other words, TWP represents the first Cluster Learning experience that you will have on campus. What does that mean?

Cluster Learning experiences involve people with different skill sets and perspectives coming together to work collaboratively on a project that reaches beyond the walls of the classroom to try to make a difference in the world. Each section of TWP is focused on a wicked problem, a societal issue that is difficult or impossible to solve. Human trafficking, homelessness, food insecurity, ocean plastics, and climate change are a few examples of the kinds of problems these sections focus on. TWP is a cornerstone course through which you begin to build the repertoire of intellectual skills needed for success in university-level work as well as for success after graduation. These intellectual skills are called Habits of Mind and we will discuss them more fully later in the book.

The project that you and your classmates work on is called The Habits of Mind project and is designed to provide you with the opportunity to practice the Habits of Mind. Your project will not "solve" the wicked problem so that the problem goes away entirely. Instead, you will work collaboratively with other students in your class on one aspect of the problem to try to make a difference in the world. You will regularly reflect on how your work on the various project activities has helped you to develop the Habits of Mind.

HABITS OF MIND

This section of the book focuses on the learning outcomes of the Plymouth State University General Education program. We call these learning outcomes "Habits of Mind." The chapter called "What are the Habits of Mind?" explains what a Habit of Mind is and describes the four Habits of Mind that your experiences in the PSU General Education program will help you develop. The chapter called "The Habits of Mind Signposts" describes the elements (called Signposts) that make up each Habit of Mind as well as the various levels of achievement on each Signpost.

Plymouth State University requires you to take classes in General Education so that you can develop some Habits of Mind that are critical to your success in college and beyond. The General Education program provides you with opportunities to practice four particular Habits of Mind. A **habit of mind** is a usual way of thinking, a way of engaging with the everyday world. The Habits of Mind that we focus on at PSU are: **purposeful communication**, **problem-solving**, **integrated perspective**, and **self-regulated learning**. "Tackling a Wicked Problem" has been designed as the first course in which you will practice each of these.

Purposeful communication is a habit of mind characterized by the construction of meaning through interactions with texts and people and the creation of new messages. "Text" refers broadly to any communicative message, including, but not limited to, messages that are spoken or written, read or listened to, non-verbal, and/or delivered through any form of media (digital, social, artistic, print, etc.). Construction of meaning and creation of messages are influenced by individuals' prior experiences as well as cultural and historical contexts. Creation of messages involves the development and purposeful expression of ideas and is designed to increase knowledge, foster understanding, and/or promote change in others' attitudes, values, beliefs, or behaviors. To be effective, messages must engage the perspectives of others and foster dialog among individuals and the community.

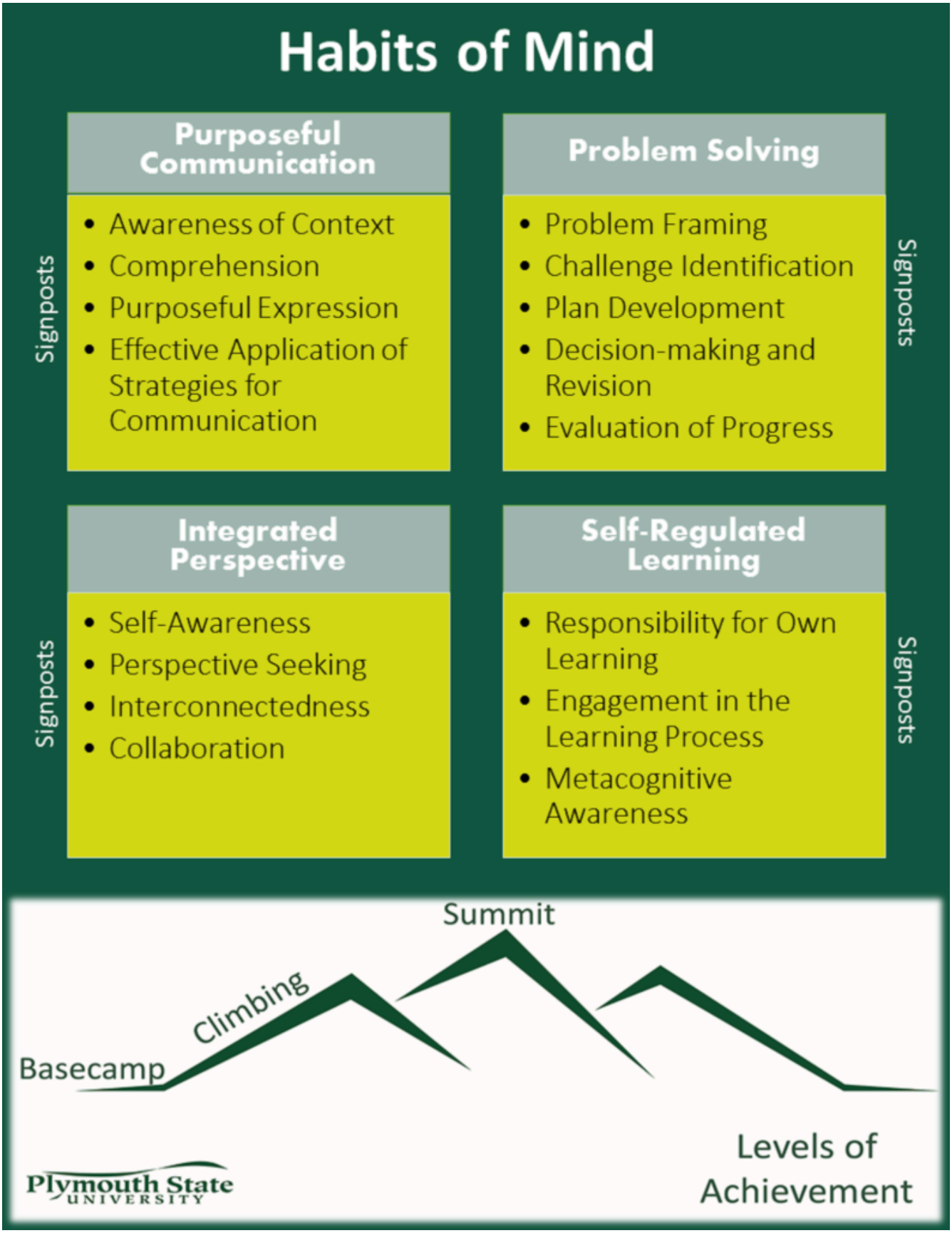
Problem Solving is a habit of mind that involves an iterative process of identifying, explaining, and exploring problems, describing challenges, envisioning possible solutions and their implications, and making decisions about how to proceed based on all of these considerations. Problem solving encompasses a broad array of activities and approaches. Problems range widely in scale and scope—small to large, local to global, well-defined to ambiguous, simulated to real-world—and problem solving may be undertaken individually or in collaboration with others. In all cases, engaging in problem solving requires the ability to think creatively, adapt and extend one's thinking, acknowledge different contexts and incorporate different perspectives, embrace flexibility, consider potential implications, determine courses of action, persist and adapt despite failure, and reflecting on the results. While the types of problems encountered and the strategies used to grapple with problems vary across disciplines, the problem solving habit of mind is relevant to all disciplines.

Integrated Perspective is a habit of mind characterized by the recognition that individual beliefs, ideas, and values are influenced by personal experience as well as multiple contextual factors—cultural, historical, political, etc. All human beings are interconnected through their participation in natural and social systems. An integrated perspective recognizes that individual decisions impact the self, the community, and the environment. Students will acknowledge the limitations of singular points of view and recognize the benefits of engaging with and learning from others in order to integrate multiple perspectives for effective communication, problem-solving, and collaboration.

Self-Regulated Learning is a habit of mind that encompasses the desire to learn, the ability to set personal goals for learning, and the capacity to engage in a self-monitored learning process. Self-regulated learners typically demonstrate strong commitment to the process of learning and take responsibility for their own learning. They take intellectual risks, persist in the face of challenges, and learn from their mistakes. They are able to organize and reorganize information, interpret information in new ways, and generate their own ideas. Self-regulated learners demonstrate meta-cognitive awareness (an understanding of the factors that influence their own learning) and cultivate the skills and confidence they need in order to be effective learners.

Developing these Habits of Mind is a lifelong pursuit. When we start developing them, we are at the "Basecamp" level of achievement which is the level of achievement your instructors at PSU expect you to have when you finish your first year here. By the time you graduate, we expect that you will have achieved the "Summit" although we also feel that no one ever completely masters any of them. Everyone, no matter how old, educated, or skilled in these Habits of Mind has something they can improve upon.

The following infographic shows the components (or "signposts") that make up each Habit of Mind in the Plymouth State University General Education program. You can read more about each of the signposts in the next chapter of this book.


Habits of Mind
Purposeful Communication
Awareness of Context
Comprehension
Purposeful Expression
Effective Application of Strategies for Communication
Problem Solving
Problem Framing
Challenge Identification
Plan Development
Decision-making and Revision
Evaluation of Progress
Integrated Perspective
Self-Awareness
Perspective Seeking
Interconnectedness
Collaboration
Self-Regulated Learning
Responsibility for Own Learning
Engagement in the Learning Process
Metacognitive Awareness
Signposts
Signposts
Signposts
Signposts
Summit
Climbing
Basecamp
Levels of Achievement
Plymouth State University

As you are practicing the Habits of Mind, you will want to get a sense of your level of achievement so you can think about what you need to do to continue to improve. The following tables indicate what we, the faculty at PSU, expect you to attain by the end of your first year at PSU (Base Camp).

For example, by the end of your first year, we expect that you will recognize that every communication message is created and receive within a cultural and historical context. This is the Base Camp level of achievement for "Awareness of Context" in the Purposeful Communication Habit of Mind. As you develop your communication skills, we expect that you will begin to draw on knowledge about cultural and historical context, both when you create messages and when you construct the meaning of messages that you receive from others. This is the Climbing level of achievement for "Awareness of Context" in Purposeful Communication. By the time you graduate from PSU, we expect that you will seek additional knowledge so that you can better understand cultural and historical contexts, both when you create messages and when you construct the meaning of messages that you receive from others. This is the Summit level of achievement in "Awareness of Context." In other words, as you become a better communicator, you begin to understand that the context of a message matters and, eventually, you recognize that you may not completely understand the context of a message so you seek more information to improve your understanding of both the context and the message. This is a challenging task and no one ever masters it. We can all improve on our ability.

These Habits of Mind represent what we want you to practice and develop through taking classes in the General Education program at PSU. Understanding these can help you to be more purposeful in your work in your classes.

Purposeful Communication			
Signposts	**Base Camp**	**Do You Have Evidence of This?**	**What's Your Evidence?**
Awareness of Context	Recognizes that every message is created and received within a cultural and historical context		
Comprehension	Shows understanding of the basic meaning of the text by paraphrasing or summarizing the information the text communicates		
Purposeful Expression	Paraphrases, summarizes, and/or quotes from information sources to create a message with a specific purpose		
Effective Application of Strategies for Communication	Recognizes that others may bring different perspectives and experiences to the creation of messages and the construction of meaning from messages		

Problem Solving			
Signposts	**Base Camp**	**Do You Have Evidence of This?**	**What's Your Evidence?**
Problem Framing	When presented with a problem, describes key components of the problem		
Challenge Identification	Recognizes general challenges to solving the problem		
Plan Development	Relies on one or two strategies to identify possible solution(s) to the problem		
Decision-Making and Revision	Identifies a preferred approach to solving the problem and sticks with the plan		
Evaluation of Progress	Evaluates progress in terms of whether desired outcomes have been achieved		

Integrated Perspective

Signposts	Base Camp	Do You Have Evidence of This?	What's Your Evidence?
Self-Awareness	Recognizes that one's ideas, beliefs, and values are influenced by personal experience as well as multiple contextual factors		
Perspective Seeking	When presented with various perspectives, recognizes their validity while maintaining a preference for one's own perspective		
Interconnectedness	Identifies some connections between an individual's personal decision-making and the larger natural and social world		
Collaboration	Articulates one's own perspective and listens to other perspectives when collaborating with others		

Self-Regulated Learning			
Signposts	**Base Camp**	**Do You Have Evidence of This?**	**What's Your Evidence?**
Responsibility for Own Learning	Strives to meet learning goals and evaluation criteria embedded in assignments and courses		
Engagement in the Learning Process	Recognizes that acquiring new knowledge and skills requires commitment to the learning process		
Metacognitive Awareness	Identifies own strengths and weaknesses as a learner and selects general strategies to aid learning		

WORKING ON YOUR WICKED PROBLEM

The chapter called "How Can Design Thinking Help Us?" focuses on using design thinking to imagine, design, implement, and evaluate a project that will have an impact on your wicked problem. The chapter called "Research on Humans" explains the Institutional Review Board (IRB) process you must go through if your project work is going to involve doing any sort of research on human beings. The chapter called "Working With and For Outside Organizations" describes the rules regarding collecting money or other goods for (or in conjunction with) organizations outside of PSU.

Trying to decide what to do about your wicked problem can feel overwhelming. Design thinking is a methodology for working on complex problems which can be helpful in our work in "Tackling a Wicked Problem." Design thinking has a "bias toward action." This means it is focused on doing things rather than studying things or discussing things. There are five stages in the design thinking process that we move around in non-linearly. We may revisit some of the stages multiple times in our work as we learn more and more about the problem we are trying to solve. The early stages of design thinking emphasize gaining a deep understanding of the problem, and developing empathy with the people affected by that problem to understand their perspectives and needs. In this way, this process is sometimes referred to as human-centered design. The later stages of design thinking focus on action. Design thinking is a process that allows teams or individuals to try out numerous solutions to a problem (to "experiment rapidly" or "prototype") to meet the needs of the client or group. Related to this idea is the importance of failing often, but failing quickly and cheaply so that you can find a solution that works. David Kelley explains in his TED Talk on creative confidence that "a series of small successes turns fear into familiarity."

The first stage of design thinking is about empathy. We need to know the people involved in the problem, especially the "end-users," those most affected by the problem. These people are called "stake holders" because they have a stake in any solutions we might come up with related to our problem. We need to know about their needs and the contexts in which they live. We need to put ourselves, as much as possible, in their shoes to think about what would be helpful. We can read stories about the lives of stake holders. We can invite stake holders into conversation with us. We might even design solutions in partnership with various stake holders. The idea is that we are not going to design solutions without understanding as much as we can about the perspectives of the stake holders.

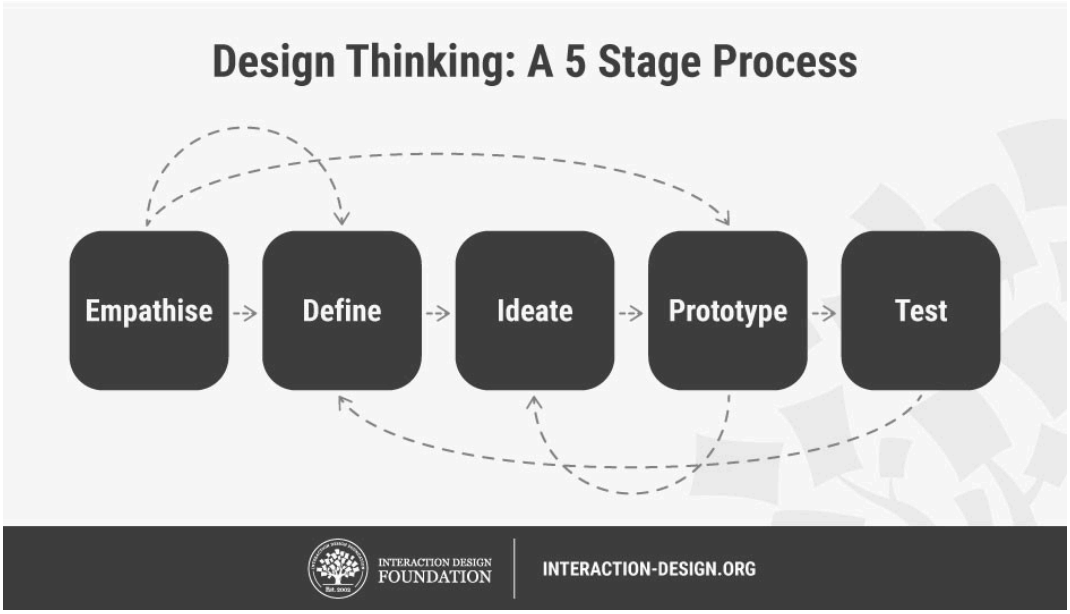
The second stage of design thinking involves defining the problem as one whose solution will satisfy a human-centered need. Notice that this definition of the problem has moved from the larger, complex problem that we are trying to work on to a smaller, more focused problem that expresses the needs of a particular group of people. We are not going to be able to "solve" the wicked problem for all of the reasons explained earlier in this OER. We are trying to make a difference in the problem and so that involves restating the wicked problem into something we can actually do something about. For example, if we are working on the wicked problem of fake news, we might decide that we would like college students at PSU to be armed with the tools that they need to recognize fake news when they see it. This won't solve the larger problem of fake news. It will continue to be created. Some people will continue to believe it. But we might be able to make a difference so that a particular population no longer believes it.

The third stage of design thinking is about ideation, where the designers (in this case, you, the students in "Tackling a Wicked Problem") generate many ideas about how to satisfy the need identified in the definition stage. You brainstorm about projects you might engage in that will make a difference in the world related to the wicked problem. In the example of fake news, you might work on the Digital Polarization Initiative, which is a web site that debunks fake news claims, by adding your own research about claims and advertising its availability to students on campus. You might create an OER about recognizing fake news and advocate for its use in all Composition classes at PSU. You might host a movie night on campus to show and discuss the documentary "Nothing But Lies: Fighting Fake News." You might come up with many, many more ideas about what you could do to help PSU students recognize fake news. Again, none of these ideas will solve the problem of fake news but each has an impact on the problem for PSU students.

The fourth stage is to build small-scale prototypes where particular aspects of the solution to the problem are chosen for implementation. This is an experimental stage where the goal is to identify the best solution to the needs with the constraints identified in the other stages. In this stage, you would implement one or more of the ideas that you had in the ideation stage. So might research a couple of fake news claims and publish your research on the Digital Polarization web site. You might write a chapter of the fake news OER and share it with your Composition instructor. And so on. The idea is that you implement some part of your project and share it with people.

The fifth stage involves testing the prototypes and often involves the development of more insights into the problem that can then be iteratively incorporated into redefining the problem or into new ideation and prototyping stages. This is where you get feedback about your prototype. You might share your Digital Polarization research with Student Senate and ask them for feedback. You might ask your Composition instructor whether she would use your fake news OER in her future classes and why or why not. The feedback that you receive will help you determine your next steps. Perhaps

you misunderstood the needs of your stake holders and so you should revisit the empathy building stage. Or maybe you defined a problem that doesn't actually need to be solved so you revisit the problem definition stage. Or you may need to ideate more possible solutions. Or maybe you need a different or revised prototype of your solution idea. The point is that design thinking is a non-linear process where each stage may lead to paths forward or backward to any other stage in the process.



Under federal law, institutions like Plymouth State University must create a group called the Institutional Review Board (IRB) to review and approve (or not) research that involves humans in order to ensure that no one is harmed by the research activities. Some of the projects that you might want to undertake in *Tackling a Wicked Problem* may need to be reviewed by the IRB. This chapter explains the circumstances for which you will need IRB approval for your project as well as the process for applying for IRB approval should you need to do so.

Do I need IRB approval for my class project?

Generally speaking, if the data are staying in the classroom (assignment being done for grading only) and data/ results won't be shared outside the classroom, IRB approval is not needed. If data may be used for an honors thesis, or presented at the Showcase of Student Research and Engagement (for example), then the project will need IRB approval as dissemination at those public events as research data is considered to be contributing to generalizable knowledge.

Individuals who wish to gather data from human subjects as part of evaluations, assessments, service, reporting, classroom assignments, educational inquiry, or practice AND intend to use the data as research data for the purpose of publishing or sharing with a research community or the public at large, must obtain IRB approval PRIOR to conducting the activity.

The PSU IRB recognizes that human subjects may be harmed by unethical or careless activities resulting from evaluations, assessments, service, reporting, classroom assignments, educational inquiry, or practice. As a board that values the protection of human subjects and the conduct of ethical behavior, the board strongly disapproves of such unethical behavior. However, the IRB recognizes the limits of its mandate and authority. The actions of individuals conducting classroom activities are also governed by the ethical standards of their discipline (e.g., American Psychological Association or American Anthropological Association).

IRB approval is required for activities that 1) involve human subjects and 2) meet the definition of "research." According to the federal guidelines, "research" is a **systematic investigation**, including research development, testing, and evaluation, designed to develop or contribute to **generalizable knowledge**.

A **systematic investigation** follows a predetermined plan for looking at a particular issue, testing a hypothesis or research question, or developing a new theory that may include:

- Collection of quantitative or qualitative data
- Collection of data using surveys, testing or evaluation procedures, interviews, or focus groups
- Collection of data using experimental designs such as clinical trials
- Observation of individual or group behavior

A contribution to **generalizable knowledge** means that the purpose or intent of the project is to test or to develop scientific theories or hypotheses, or to draw conclusions that are intended to be applicable and/or shared beyond the populations or situations being studied. This may include one or more of the following:

- Presentation of the data at meetings, conferences, seminars, poster presentations, etc. – including the poster symposium at the end of the semester
- The knowledge contributes to an already established body of knowledge
- Other investigators, scholars, and practitioners may benefit from this knowledge
- Publications including journals, papers, dissertations, and master's theses

If the project does not meet the definition of research (i.e. is not a systematic investigation or does not contribute to generalizable knowledge), as described above, then the project does not require IRB review and an IRB application is not required.

Examples of studies that ARE considered research with human subjects:

1. Studies that utilize test subjects for new devices, products, drugs, or materials.
2. Studies that collect data through intervention or interaction with individuals, if the information is about the

individuals (including their opinions/views/thoughts). Examples of this type of research include behavioral interventions, surveys, studies that involve deception, research involving risky behaviors or attitudes, focus groups, and open-ended interviews with minors that contribute to generalizable knowledge.
3. Studies using private information that can be readily identified with individuals, even if the information was not collected specifically for the study in question.
4. Studies that use human bodily materials such as cells, blood, urine, tissues, organs, hair, or nail clippings, even if the researcher did not collect these materials for the study. However, such research may not be considered human subjects research if the materials/data are coded and the investigator does not have access to the coding systems. Guidance on research involving coded private information or biological specimens is available here; https://www.hhs.gov/ohrp/regulations-and-policy/guidance/research-involving-coded-private-information/index.html.
5. Studies that produce generalizable knowledge about categories or classes of subjects from identifiable private information.
6. Studies that use human beings to evaluate environmental alterations, for example, weatherization options or habitat modifications to their living or working space or test chamber.

Examples of studies that are NOT considered research with human subjects:

1. Data collection for internal departmental or other University administrative purposes. Examples: teaching evaluations, customer service surveys.
2. Information-gathering interviews where questions focus on things, products, or policies rather than people or their thoughts regarding themselves. Example: a survey of employers that asks whether the employers offer certain employee benefits programs, without asking for the opinions or thoughts of the individuals who respond to the survey.
3. Activities involving human subjects within the context of research methods courses generally do not require IRB review, unless the results will be used for research purposes (e.g., presented at PSU undergraduate or graduate research conferences or used in a thesis or dissertation).
4. Program evaluation/quality improvement/quality assurance projects are generally not considered research if these activities are designed specifically to assess or improve performance within a department, hospital or classroom setting. The intention of the project is not to generate conclusions that can be applied universally, outside of the immediate environment where the project occurs. To determine whether a proposed quality improvement activity also qualifies as research (thus requiring IRB review), consult the Office of Human Research Protections (OHRP) guidance on quality improvement activities here: https://www.hhs.gov/ohrp/regulations-and-policy/guidance/faq/quality-improvement-activities/

How do I apply for IRB approval?

If you believe your project needs IRB approval, below are the steps to follow next:

1. Complete the mandatory CITI Research training which can be found here: https://campus.plymouth.edu/research-administration/training-2/compliance-training-citi/.
2. Email psu-irb@plymouth.edu to ensure that your project needs IRB approval. Your subject line should be: Tackling a Wicked Problem. Provide a brief summary of your project including the participants you will be working with and the basic methodology.
3. If the IRB determines that your project needs IRB approval, complete the IRB application checklist, IRB application, and informed consent documents which can all be found here: https://campus.plymouth.edu/institutional-review-board/how-to-apply/
4. Submit your documents and CITI Training certificate to psu-irb@plymouth.edu.

Once you submit your application to the IRB, you will get a response in 1 to 4 weeks. You should include this time in your project planning.

When you are working on projects, you are a representative of Plymouth State University. Because of that, there are rules that you will have to follow. Most of the rules arise when you are working with an outside organization on activities related to fundraising and donations, whether you are partnering with that organization or not and whether that organization is for-profit or not. If you plan to raise money or collect goods of any kind in your project, you must follow the rules explained in the following USNH and PSU policies. The process described will take **between 2 weeks and a month**. Be sure to include this time in your project planning.

Charitable fundraising activities for the benefit of outside parties are generally not allowable, except by registered student organizations or official athletic teams. USNH Policy 08-006 explains this policy in detail: https://www.usnh.edu/usnh-financial-services-policies-and-procedures/08-006-contributions-charitable-and-political

The University understands, however, there may be times when this is a worthwhile activity for students to engage in. Approval of such activity is determined on a case-to-case basis and takes into account the value of the learning outcomes, as well as institutional risk and institutional resource investment. Plymouth State University's policy can be found here: https://campus.plymouth.edu/financial-services/wp-content/uploads/sites/14/2019/08/Fundraising-for-External-Entities-Policy-and-Guidelines-8-19-19-Final.pdf

If you are interested in working on a project that involves any sort of fundraising or donation collection for an outside organization, you (or your instructor) must first contact the Coordinator of General Education, Cathie LeBlanc (cleblanc@plymouth.edu). Again, be aware that getting approval to engage in these activities will take **between 2 weeks and a month** and you should include that time in your project planning.

INFORMATION LITERACY

Getting a perfect, 100% accurate understanding of your wicked problem would be a difficult, time consuming, and frankly unrealistic goal. Seeking the fullest truth of an issue or situation is the pursuit of a lifetime – you might even think of it as one of the goals of becoming an educated person, one that you will work on your whole life. But on a much smaller time scale, on a day-to-day basis, it is possible to gather the basic facts of a situation, and to make accurate judgements of the information you encounter. Let's focus then on always improving the quality and accuracy of the set of information in front of us. If we do that, we can get pretty close to the truth. And it doesn't even have to be painful or extremely time intensive.

After going through these chapters you will be well equipped to do the kind of research that is required to get to know a wicked problem. We'll go through the process of examining what you already know and believe about your wicked problem and navigating a rich information environment. Knowing how to start research on a topic that is totally new to you will come in handy throughout your college career and, assuming we don't solve all the world's wicked problems this semester, your life.

So what level of research do you need to do to participate in the conversation about your wicked problem? How can we find out what the different perspectives are? How will we know we aren't missing important parts? What kinds of sources are out there and how will we know if the one we found is useful? What will our own participation in the conversation look like? In the next seven chapters we will tackle these questions.

In This Chapter...

Learning Objectives

- Recognize the challenges associated with our current information environment
- Understand the layout of the following chapters and how they relate to your project

Summary

The challenges of our current information environment often make us feel like there is too much information and it is all equally bad. While perfect, black and white answers rarely exist, it is entirely possible to move toward better information. The skills and habits in these chapters may be different than other advice you have gotten, but they will help you learn enough about your wicked problem that you can contribute to making it better.

Our Information Environment

Our information environments are getting more complex, more polarized, and more fragmented. Just a few decades ago, everyone in the United States got their news from the same three networks or the same five newspapers. Today we must navigate, evaluate, and choose among thousands of different content producers and platforms. The proliferation of messages and channels means that it is now possible (and quite common) to choose information sources that closely align with one's identity, preferences and existing beliefs. This also means that it is possible (and also quite common) to be exposed to a completely different set of information than the person sitting next to you.

Even when we don't consciously choose sources based on one particular point of view, the platforms we use may choose it for us. Social media feeds and search engines decide what to show us based on algorithms, rule-based procedures for completing a task. The algorithms that determine what each of us sees in our search results and social media feeds are based on the rich, detailed data companies have collected on our past behavior and preferences.

Algorithms aren't intrinsically bad, but they can have negative and unintended consequences depending on how they are created and applied. A company may only be trying to keep you on their website for as long as possible to increase their advertising revenue. But what happens when they discover that showing you content that evokes a strong emotional response is the best way to do that? What happens when content creators discover that their most polarizing content gets the most views? It's no wonder our society is so polarized.

With such a large array of sources filled with increasingly polarized content, how are we supposed to get to the truth? How are we supposed to understand our wicked problem well enough to try to make it better?

Information Cynicism[1]

> "Without feeling empowered to sort fiction on the web, a lot of students are merely cynical and believe they can't trust **anything**" ~Michael Caulfield[2]

This probably isn't the first time you've thought about the problems described above. Within all these competing messages, you may have even begun to feel cynical about the possibility of figuring out the accuracy of anything. If you feel this way, you're not alone. This feeling is so common right now that it has a name: information cynicism.

- **Skeptical**: Not easily convinced; having doubts or reservations
- **Cynical**: Believing that people are motivated purely by self-interest; distrustful of human sincerity or integrity

When it comes to information you encounter in your personal, professional, or academic research, a skeptical approach can be productive. For example, information skeptics might take a moment to fact check, verify, or investigate a source before using or sharing it.

However, when skepticism turns to cynicism, the feeling can stop you from even trying, from taking the steps that are possible to determine the accuracy of information. Information cynics may feel powerless to identify reliable and useful sources. That is, while learning to question everything, they have begun to believe nothing—even highly-credible sources of information.

It is frustrating that our information environment is so difficult to navigate, and it's ok if you feel this way right now, but let me assure you that this feeling doesn't have to be the end of your journey. It is possible to make informed decisions about what information to trust. There actually is better and worse information, even if there isn't always a 100% correct and complete answer. This is one thing we will explore in the coming chapters.

Information Literacy Myths

On this path to better information we may make suggestions that are different from what you've been told during your previous research experiences. Here are some of the myths or outdated approaches that we'll be busting in the next few chapters:

> **Myth**: You should only use library sources/internet sources are bad.
>
> **Fact**: There are amazing sources available for free on the internet, so let's use both library and internet sources and not limit ourselves. The internet is an amazing tool for gathering context and moving toward a more accurate understanding of an issue.
>
> •
>
> **Myth**: Don't use Wikipedia ever.
>
> **Fact**: Wikipedia is problematic, but probably not in the way you've been taught. Wikipedia is a great tool for

1. Content in this section is derived from the Information Cynicism chapter (3.3) of Introduction to College Research (CC BY) by Walter Butler, Aloha Sargent, & Kelsey Smith (https://human.libretexts.org/Bookshelves/Research_and_Information_Literacy/Book%3A_Introduction_to_College_Research_(Butler_Sargent_and_Smith))
2. Michael Caulfield quoted in Jeffrey Young's "Can a New Approach to Information Literacy Reduce Digital Polarization?" (https://www.edsurge.com/news/2018-03-22-can-a-new-approach-to-information-literacy-reduce-digital-polarization); emphasis added

preliminary research, although the way it's created means it is particularly likely to reproduce the biases of its editors.

•

Myth: .org is great/.com is bad.

Fact: There is no gatekeeping of the .org domain, a wide variety of groups can and do use the .org domain. While many reputable organizations use .org, so do a variety of hate groups. The .com domain is short for "commercial" but not everyone who has a .com website has a profit motive.

•

Myth: Some formats are good (books, journal articles) and others are bad (blogs).

Fact: The format of a source is independent of the processes used to create it. A book can be produced by a team of editors, subject experts, fact-checkers, peer reviewers and copy editors, or it can be self-published, with none of these controls. Understanding who created a source, for what reason, and under what kinds of gatekeeping is more useful than limiting yourself to a particular format ever will be.

The Next Few Chapters

Getting a perfect, 100% accurate understanding of your wicked problem would be a difficult, time consuming, and frankly unrealistic goal. Seeking the fullest truth of an issue or situation is the pursuit of a lifetime – you might even think of it as one of the goals of becoming an educated person, one that you will work on your whole life. But on a much smaller time scale, on a day-to-day basis, it is possible to gather the basic facts of a situation, and to make accurate judgements of the information you encounter. Let's focus then on always improving the quality and accuracy of the set of information in front of us. If we do that, we can get pretty close to the truth. And it doesn't even have to be painful or extremely time intensive.

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- **Our Mental Shortcuts**: Our brains have developed some shortcuts to deal with the overwhelming amount of information around us. Usually that's a good thing, but some of these shortcuts, such as confirmation bias, can have serious consequences for our research. We'll think about ways we can recognize and mitigate these shortcuts.
- **Identifying a Topic**: Learning about your wicked problem and identifying an area of it to work on **are not** separate activities We'll talk about strategies for reading and learning about your topic that will help you get the big picture and help you find an area of inquiry that is meaningful for you.
- **Types of Sources**: Before we start searching it's good to know what types of sources we might find out there. Problem is, there are a lot of different ways to categorize sources. We'll talk about some useful ways to think about the sources you find.
- **Access & Searching**: We may start our searches with Google, but there are good reasons not to stop there. We'll talk about the limitations of different search tools and some strategies for getting the most out of them.
- **SIFTing Information**: Here we get into some concrete steps that we can use to assess the credibility of a source or

claim.

- **Evaluating News Sources**: It does no good to ignore all news sources that have bias – all sources are biased in some way. When considering the accuracy of news sources it's helpful to understand the difference between bias and agenda and between news gathering and news analysis.
- **Audience, Presentation & Citation**: Once you're informed on your wicked problem and want to share your own perspective, project, or plan, you'll need to think about the best way to do that. Thinking about your audience will help inform your own creation processes, presentation choices, and even how you choose to cite information.

Reflection & Discussion Question 1: Information Cynicism

Review the description above of information cynicism.

- How accurately does this describe your feelings or those of your peers?
- How do you feel about your ability to navigate your information environment right now?

Reflection & Discussion Question 2: Reflecting on Your Research Education

Think about the research advice you've gotten in the past. This could be from teachers, librarians, or friends and family.

- What was the most helpful research advice you've gotten?
- Describe a piece of unhelpful advice that you were given, or a piece of advice that didn't line up with your own experiences of research. What would have been better advice?

Reflection & Discussion Question 3: Looking Ahead

Review the descriptions of the next few chapters.

- What topics are you most interested in?
- What part of research worries you the most?
- What is one research skill you hope to improve?
- What three words best describe how you feel about doing research right now?

Reflection & Discussion Question 4: Looking Back

At the end of the semester, review your answers from the exercises above.

- Were you able to improve on the skill you chose in exercise 3?
- What three words best describe how you feel about doing research at this point? Have they changed?
- What advice or content from these chapters was the most helpful? Least helpful?
- Are there topics or skills that you wish had been discussed that weren't?

In This Chapter

Learning Objectives

- Understand how our existing knowledge and mental shortcuts are likely to affect our research process
- Identify strategies for overcoming our cognitive biases

Summary

Cognitive biases are shortcuts that help us deal with the huge amount of information in our environments, but they can hurt our research processes. Confirmation bias means we are more likely to search for and notice information that confirms our existing beliefs. Motivated reasoning means we think more critically about information that challenges our beliefs than we do about information that confirms our beliefs. A mindset based on curiosity and openness will help us mitigate our cognitive biases and see that changing our minds based on new information isn't the end of the world.

"The brain is a machine for jumping to conclusions." ~Daniel Kahneman[1]

Every human is inundated with information every moment of their life. Not just the research information we talk about in this book, but all sorts of information. All the light that hits our eyes and tells us where things are in the room, every noise we hear, every clue from our environment. It is not possible to think critically about every piece of information that comes our way, and we don't need or want to.

We have all developed mental shortcuts to deal with this information overload. Researcher Daniel Kahneman describes the situation this way: we have two systems for processing information, the first, System 1, that runs effortlessly and involuntarily and a second one, System 2, that takes more effort to use.

Let's see if we can catch these systems at work. Try out this problem:

> A bat and ball together cost $1.10 and the bat costs $1 more than the ball. How much does each one cost on its own?

Many people get this answer wrong because they use a mental shortcut without even realizing it. (The correct answer and an explanation is available here.) To get to the right answer we have to resist the tempting, easy answer offered by System 1, and engage the careful thinking of System 2.

The System 1 runs automatically; it is in charge most of the time and it is the system that helps us make quick judgements about the vast majority of input coming into our brains. System 2 takes effort to use, is only activated occasionally, but it can do much more complicated things. The fact that we use System 1 most of the time isn't a problem, it's our brains working as they should. They help us not expend energy needlessly on things that are unlikely to be important. We're not bad people because we jump to conclusions much of the time. But the effects of System 1 extend into our research activities in ways that can lead us to make mistakes.

1. Content and quotes in this section are from Daniel Kahneman's 2011 book, Thinking Fast and Slow.

Cognitive Biases

There are many different mental shortcuts our brains take when System 1 is activated; we call these cognitive biases. **Cognition** refers to a variety of thinking processes such as attention, perception, memory, and reasoning that we use to gain knowledge and understanding. "Cognitive biases" does not refer to biases related to a particular opinion, rather it refers to biases that all of our brains have to behave in a certain way as we try to make sense of the world. There are **a lot** of different cognitive biases, but here we will just mention two that are quite likely to impact our research activities.

Confirmation Bias

Confirmation bias relates to the information we look for, notice and remember. Confirmation bias makes us more likely to notice information that confirms our existing opinions and beliefs. If we're scanning a list of search results, the sources that support our existing beliefs are more likely to jump out at us; they are familiar and require less energy to process. Similarly, we are likely to not notice results that run counter to our existing ideas.

But the part of confirmation bias that is most likely to affect our research is how it affects our choice of search terms. We can't help but choose search terms based on what we are already thinking. And it's not surprising that if you search for *why Marvel is better than DC* you will find info that supports this claim. Google (or your search engine of choice) tries its hardest to match the words in the search box with words on websites. The sources that most closely match your search terms are also very likely to share the opinion that was embedded in your search terms.

Similarly, if you search *is lab testing on animals wrong*, you get very different search results than you would if you search *benefits of animal testing*.

But even when we don't type value words like *better*, *wrong*, or *benefits* into the search box, some words are more associated with one position than another and are likely to return results associated with only one position. For example, compare the results you get for the search *illegal aliens voter fraud* with those for *immigrant voting rights*. Both searches involve the concept of people born outside a country participating in elections, but the pictures you get from the results are very different.

> Sometimes people use this property of search terms to steer you toward a particular conclusion. If someone online is telling you to "do your own research" while at the same time repeating words and phrases that are only used by proponents of one side of an issue, they don't really want you to find a variety of perspectives, just the one associated with those terms.

Motivated Reasoning

Motivated reasoning relates to how we think about a piece of information. Motivated reasoning happens when we readily accept pieces of information that support our existing beliefs without much thought, and we expend more effort to think critically about pieces of information that challenge our existing beliefs or behaviors. Examples of this are everywhere, but my favorite is a study that asked people to read and evaluate a research paper that suggested that drinking coffee had negative health effects. Coffee drinkers were much more likely to question the validity of the research than non-coffee drinkers.

This is a mental shortcut that saves a lot of time and mental energy. Many things we believe don't need to be reexamined on a regular basis, and it would be a big energy drain if we did. Generally, we all believe that brushing our

teeth is a good idea. There's not much to be gained by critically examining another piece of evidence that brushing your teeth is good. So we skip over thinking about information that matches up with what we already believe.

On the other hand, when those coffee drinkers were given information that suggested their habit might be bad for their health, their only choices were to accept the information (and either deal with an uncomfortable idea or try to break the habit), or find a reason to reject the information. The easier choice in that situation was to work a little harder to find a reason to discredit the information.

These coffee drinkers aren't bad people, and they weren't consciously deciding to think critically about the research in front of them. These shortcuts are just part of being human, and there's no need to attempt the impossible task of avoiding them entirely. It is very hard to notice motivated reasoning in ourselves because this is an automatic process. But motivated reasoning does have big implications for research because it tends to reinforce what we already believe.

What Can We Do About Cognitive Biases?

In the video below, Julia Galef mentions several things that can help us overcome our cognitive biases and improve our judgement.



One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://pressbooks.usnh.edu/wickedproblem/?p=40#oembed-1

The first step is one you've already done: become aware that these cognitive biases exist. Just knowing that motivated reasoning is a thing won't magically prevent your brain from taking this shortcut, but you can't compensate for it until you know it exists. This is part of increasing your metacognitive awareness.

Be kind to yourself and others during the research process. Galef mentions the strong tendency in our society to criticize people who change their minds. We seem to have adopted the strange idea that revising your positions is a sign of weakness, that there is nothing worse than being wrong. We can change this perception by giving each other space to grow and revise our ideas and by expressing approval when people demonstrate a willingness to revise their opinions

after careful consideration of new information. We don't need to tie our self-worth or the worth of others to how right or wrong we or they are on a particular issue.

Galef also mentions that feelings play a big part in how we deal with new information. Notice your feelings as they come up during your research. In the chapter, SIFTing Information, we talk about how having a strong positive or negative emotional reaction to a piece of information is an important cue to stop and check that piece of information. The Oatmeal comic strip creator, Matthew Inman has an entertaining assessment of our emotional reactions to new information (10 minute read):



George Washington's Teeth, The Oatmeal, https://theoatmeal.com/comics/believe_clean

Be aware of your feelings as they come up, but don't let them have the final say. As Galef suggests, try to cultivate feelings of curiosity, openness, and groundedness.

Another practice that can help us overcome our cognitive biases is actively seeking out disconfirming ideas. Researcher Sonke Ahrens[2] suggests that instead of asking whether a source will reinforce the position we hold, we try asking whether it is relevant to the topic. If you are someone who struggles to find something to write about, this shift in perspective can have an added benefit: working through the tension between the ideas you started with and the sources that challenge those ideas will give you things to write about.

> "Do you yearn to defend your own beliefs? Or do you yearn to see the world as clearly as you possibly can?"
> ~Julia Galef

Reflection & Discussion Question 1: Taking Stock of What You Already Know

2. I highly recommend Sonke Ahrens' 2017 book How to Take Smart Notes

Let's consider what you already know about your wicked problem. You may be surprised at how little or how much you already know, but either way you will become more aware of your own background on the topic, and therefore more aware of what direction your cognitive biases might nudge you in.

Construct a chart using the following directions:

- In the first column, list what you know about your topic.
- In the second column, briefly explain how you know this. (Heard it from a friend or family member, read it in a book, saw it on a blog, etc.)
- In the last column, rate your confidence in that knowledge on a scale of 1 (least confident) to 10 (most confident).
- Look over your chart and compare columns 2 and 3. Select three rows and for each one, write a reflection on whether the source of information justifies your confidence level.
- Underline any information that you think might need to be checked or that you would like to find additional sources on.

Reflection & Discussion Question 2: Mindmapping

Confirmation bias can be hard to overcome because by definition it makes us less likely to even notice certain kinds of information. In this exercise we'll try to find some our blind spots by creating and sharing mindmaps.

1. Create a mindmap of your wicked problem. Include as many different aspects of the problem as you can: different issues, possible solutions, challenges, anything that comes to mind.
2. Trade papers with a partner. Review their mindmap for aspects of your wicked problem you may have overlooked and add any aspects that you thought of that aren't there.
3. Trade papers with another pair, and repeat the process.
4. Get back your original paper and consider the additions made by your classmates. What was added that you hadn't thought of? Did anything about the additions surprise you?

Reflection & Discussion Question 3: Loaded Search Terms

In the confirmation bias section above we saw examples of search terms that return a limited range of viewpoints. For most topics it is possible to find "loaded" search terms that have this effect.

- What search terms related to your wicked problem are likely to return one particular viewpoint?

- What neutral search terms can you think of related to your wicked problem? Are any search terms really neutral?
- Should we always avoid loaded search terms, or are there times when they're ok to use?

Reflection & Discussion Question 4: Thesis Statements

Have you ever had an assignment that required you to come up with a thesis statement before proceeding with your research? It's a common approach. Often what gets lost in these assignments is that the goal is to test the thesis, not justify it. But many of our mental shortcuts nudge us towards maintaining our existing positions.

- Think about how you usually approach assignments. Are you more likely to start with a thesis statement or more likely to start with a question? What do you like about your approach? What do you not like about it?
- In the past how have you handled it when you encountered information that argued against your thesis statement? Do you think you will handle it differently based on the ideas in this chapter? Why or why not?
- What kinds of assignments or instructions would make you more likely to be open to revising your original position or thesis statement?

Reflection & Discussion Question 5: Algorithms & Cognitive Biases

In the Introduction chapter we mentioned some ways that algorithms determine what information we see online.

- What connections do you see between our cognitive biases and an information environment driven by algorithms? In what ways do they work together?
- What actions do you take or can you think of to break out of the "filter bubbles" and "echo chambers" we find ourselves in?

In This Chapter

Learning Objectives

- Learn strategies for identifying a research topic
- Locate sources that provide an overview of your topic

Summary

A research topic isn't something you have to pull out of thin air. Rather you should read about your topic, see what ideas are most interesting to you, and respond to them. Reading overview sources is a good way to get the big picture and decrease the likelihood that you will overlook a major part of the conversation.

"Coming Up" with a Topic

There really isn't a part of research called "coming up with a topic." It isn't an activity that you can separate from "reading about a topic" or "writing some thoughts down about a topic." You may already know quite a lot about your topic, but brainstorming as though the perfect topic and question are already in your head waiting to come out can be stressful and, as we saw in the last chapter, this can be a recipe for motivated reasoning and reinforcing our existing beliefs. We need to get a sense of the variety of issues and perspectives relevant to a wicked problem before we can make a good decision about what to focus on.

So if you are the kind of person who struggles to pull a topic out of thin air, you can stop worrying about that now. In this chapter we propose a different strategy: read some introductory material on your topic, write down what captures your attention, and then connect it to what you care about. Even if you don't struggle with brainstorming topics, try this approach and see how it compares.

Reading

Again, coming up with a topic cannot be separated from reading. How will you know what interests you most about a wicked problem if you haven't been exposed to all the different facets of it? Why just choose the first thing that comes to mind when you could explore the topic and find a direction that connects meaningfully to your own life, one that you maybe didn't know existed?

Start by reading the material that your instructor provides. (Sometimes your instructor won't provide any, or it won't spark any ideas for you. That's ok. Below we'll cover how to find your own introduction to a topic.)

There are many different kinds of reading, and they are all ok. You may do a lot of skimming when first learning about a topic. You may skim most of an article or chapter and then find one section that really grabs you, then slow down and read that more carefully. You may skim a source once and decide to try something else, or you may decide it's worth a second closer reading. (You might be surprised at what it's possible to miss when you only read something once.)

Sometimes you will find yourself reading something that does not spark any interesting questions, where you don't find any interesting ideas to collect. That's ok, just move on to the next reading.

Remember, scholarship is a conversation. Most ideas don't spring forth, from thin air. Ideas come from your brain responding to other ideas. While we usually talk about reading texts, there's no reason you can't get ideas from "reading" another format. Ideas can come from a conversation, a podcast, a video, an image or an infographic.

Finding Introductory Reading

Maybe your instructor has provided you with some preliminary readings or maybe you've found some readings on your own that piqued your interest. Great! Start with those. But if you find yourself in a situation where you need to get started on your own, here are a few suggestions.

Look for something written for a **popular audience**. Some sources, like academic, peer-reviewed articles and some books are written with an expert audience in mind. They may assume that the reader already knows quite a lot about a topic and use specialized vocabulary that most people aren't familiar with. Other sources are written with a popular audience in mind, meaning they don't assume the audience has specialized knowledge or use highly specialized vocabulary without explaining it. Works created for a popular audience include newspaper and magazine articles, some books, and a ton of videos, blogs, and podcasts.

Look for an **overview** of the topic. Even if something is written for a popular audience, it may only address a small slice of a topic. Having a small scope isn't necessarily a bad thing, (ultimately, it will be a great thing for the topic you choose to look at), but it's a very different thing to read a source that represents one viewpoint about one aspect of a topic than it is to read a source that intentionally tries to synthesize all the major viewpoints and aspects of a topic into one relatively short reading. It's actually very difficult to write a good overview of a topic since it requires awareness of all the voices in a conversation around a topic.

Happily, there is one type of source that is both written for a popular audience and written for the specific purpose of providing an overview of a topic. **Encyclopedias**. These things are way more awesome than you ever thought and there are way more different kinds that you may have ever realized.

Wikipedia

You probably already knew that Wikipedia is an example of an encyclopedia. It is written at a level everyone can understand and aims to provide an overview of all significant topics. In the past you may have been discouraged from using Wikipedia in your research, but usually what your teachers were trying to convey is that your research shouldn't end with Wikipedia. It shouldn't be your only source because entries (especially those on less popular or more obscure topics) are subject to vandalism and inaccuracies.

But using Wikipedia for preliminary research is perfectly acceptable. The introduction paragraphs, the table of contents, and any sidebars can be very helpful in putting your topic into context and letting you know about specific issues within that topic. It can be a great source of search terms, and the References and Further reading sections can lead you to other useful and relevant sources.

There is reason to be cautious about the information you find on Wikipedia. There is no one editor with responsibility or control over all of the content. No one is carefully selecting subject experts to be involved in the creation of Wikipedia entries. No one's professional reputation depends on making sure the information is accurate and that nothing is left out. Wikipedia's editors are volunteers, and generally they do take the work they do seriously, but the creation process is fundamentally different than other encyclopedias.

Subject Encyclopedias

The most famous encyclopedias, like the Encyclopedia Britannica, are general encyclopedias that try to summarize literally all of human knowledge into one set of books. Cool idea, but for our purposes, there is a different kind of encyclopedia that is more useful: subject encyclopedias. These are created to provide overviews of all the topics in a certain area or discipline. For example:

- Encyclopedia of Sociology
- Encyclopedia of the Mind
- Encyclopedia of Clothing & Fashion
- American Immigration: An Encyclopedia of Political, Social, and Cultural Change
- Guns in American Society: An Encyclopedia of History, Politics, Culture, and the Law

Each one has been crafted by experts in that particular field with the express purpose of providing an overview. But these overviews can be more targeted and more in depth than what you get in a general encyclopedia or in Wikipedia. There are literally thousands of subject encyclopedias. Some are available in print at the library and some are available online. You can search within many of the library's online encyclopedias at one time by using the Gale Ebooks search. For example, if I try searching there for articles about *work* some of the results are:

- Work (7 pages) in the Encyclopedia of Human Development
- Work (4 pages) in the Encyclopedia of Religion
- Work Time (10 pages) in the Encyclopedia of European Social History
- Work Life Balance (3 pages) in the Encyclopedia of Small Businesses
- Work and Family (10 pages) in the International Encyclopedia of Marriage and Family

In each of these cases we have an article of ten pages or less that we know will attempt to summarize the whole topic. In other types of sources, like magazine or journal articles, you could easily read ten pages and get only one perspective on the topic. This is a major strength of starting with an encyclopedia: **they are intentionally created to synthesize a variety of perspectives on the topic.** Also, depending on which encyclopedia you choose, you can explore different aspects of your topic. It's not hard to imagine that the first two articles listed above will have different emphases even though they have the same title.

As with Wikipedia, subject encyclopedias are a start; they aren't going to be the only sources you consult. Also like Wikipedia, most encyclopedia articles list other sources at the end to lead you to more information. In subject encyclopedias, these tend to be very carefully curated lists of the most important works on the subject.

Take Notes and Write About Your Ideas[1]

The important thing is to jot down some notes as you read; this is how you can turn your reading into topic ideas. Think of it as collecting the most interesting information from whatever you are reading. Always read with a pen in your hand or a file open to capture some notes. Don't overthink this part, just make a note whenever something seems interesting or makes you think of a new idea or connection.

After you've read some introductory material and gathered some notes, try writing about them. Writing is really just

1. The content in this section is adapted from Sonke Ahrens 2017 book, How to Take Smart Notes

a way of thinking. Try doing a free write about how the ideas you gathered connect to your interests, to your life, or to something that you think is important. After you've read a source, try asking yourself these questions about it:

- What is missing?
- What else could be relevant to this?
- How does it connect to ideas I had from another reading?
- What is the difference between this and [some other thing]?
- What is this idea similar to?
- How does this relate to what I already thought about this topic?
- Are these two ideas contradictory or do they complement each other?
- How is does this connect to my life or interests?

If there are questions that you come up with that you can't resolve, it might be time to do some research on those particular questions. In the next couple chapters we'll talk about ways to find a wider variety of sources related to your particular questions.

Iterate

> "It would be quite sad if we did not change our interests during research." ~Sonke Ahrens[2]

The ideas in this chapter are meant to help you find a topic to learn more about, to help you get started. You will likely choose more in-depth sources as you progress. But it is also likely that you will continue to use the same steps of searching, reading, and writing/thinking over and over again, even as you move past the preliminary research. **Iteration** is the repetition of a process in order to move toward a particular goal. You will iterate through your research process. With each iteration you will focus on a different or narrower piece of your wicked problem.



2. Ahrens, S. (2017). How to Take Smart Notes. p138

3

The **scope** of your research refers to what part of your wicked problem you choose to focus on. Over time, the scope of your project is likely to get smaller and more specific. It's tempting at first to choose a broad scope, assuming that that will make it easier to find information. However, the reality is that the more narrowly defined the scope of your project is, the easier it will be to learn what you need to know and be able to identify a helpful action to take.

For example, you may start out with the wicked problem of occupations burnout. This is a big problem that could be made more manageable by focusing on:

- a particular demographic (young or older workers, men or women)
- a particular location (New England, New Hampshire, or even Grafton county)
- a single industry (service workers, medical professionals, etc.)

Less frequently, you may have to expand the scope of your project. Both narrowing and broadening the scope of your research is okay. The point is that with every iteration, we increase our understanding of the wicked problem and move closer to identifying and implementing a realistic project.

When we talk about "research" in these chapters, we mean the kind of research that involves learning from existing sources of information, rather than the kind of research that involves generating new knowledge through experimentation. But there are some similarities between these two activities: both of them are about increasing our understanding of the world and both benefit from iteration. In the video below (5 minutes,) Matt Andrews discusses how he uses iteration to develop solutions to problems he identifies in his work on international development. As you watch, consider what iterative steps you might take to learn about your wicked problem. How could you use iteration to come up with and test different approaches to your wicked problem?

https://youtu.be/48gpD05PVc8

Reflection & Discussion Question 1: Wiki vs Subject Encyclopedias

Read the article Can You Trust Wikipedia? (approximately 10 minute read) where 7 subject experts review Wikipedia articles about their areas of interest.

Next, use the Gale Ebooks search to identify a subject encyclopedia entry on an aspect of your wicked problem. Then try to find a Wikipedia entry on the same topic. Once you have done this, read them both.

- What differences did you notice between the two articles?
- Did you notice any of the kinds of errors or problems in the Wikipedia entry that were mentioned in the article?
- Which one had the better list of references at the end? What made it better?

3. Icons from the Noun Project: Search by DinosoftLab, open-book by bainy, note by DinosoftLab, think by StringLabs

Reflection & Discussion Question 2: Bias in Wikipedia

Wikipedia is created through numerous additions, edits, and conversations. Have you ever noticed the Talk tab at the top of each Wikipedia entry? This is where you can see the behind the scenes conversation between all the people who have edited the entry. One criticism of Wikipedia is that it is often the loudest, most persistent voices, with the most free time that get to keep their edits up.

This is only one way that bias can show up in Wikipedia. Review the Wikipedia article on Systemic Bias to get a sense of other ways the perspectives offered by Wikipedia may be unbalanced.

- Locate a Wikipedia entry on a contentious issue and click on the Talk tab at the top of the screen, (you may need to click "Archives" to see older discussions.) Read through some of the conversations you find there. What did you notice about the conversations?
- Of the forms of bias mentioned in the Wikipedia article above, which do think are most problematic and why?

Reflection & Discussion Question 3: Iteration & Research

Above we mentioned that there are two different kinds of research, one that relates to finding and learning from information sources that already exist, and one that relates to generating new knowledge, often through experimentation, data collection and analysis. In the video above Matt Andrews discusses iteration as a method for solving problems. Andrews says:

> "You try something, you learn from the thing. You trying something else…you learn from that…and over time you come up with a solution."

The "thing" could be reading a source, but it could also be conversations with people or groups, or gathering your own data.

- When is "library" research useful and when is "experimental" research useful? Should one come before the other, or should they be used together? To what extent is the distinction between them a useful one?
- What will your next iteration look like to improve your understanding of your wicked problem? What specific steps will you take? Will it involve source-based research or experimentation?

In This Chapter

Learning Objectives

- Gain awareness of the types of sources that make up our information environment
- Use different characteristics of a source to determine how it might be useful to your research

Summary

Sources can be categorized in many different ways. A common, but not very useful way is to categorize them by format, like print vs. online, or books vs. articles. But we can gain a better understanding of a source if we understand how to categorize it according to what kind of creator made it or what processes were involved in its creation.

There are a lot of different ways to categorize sources. In the chapter Identifying a Topic, we mentioned two of them: a source can be categorized according to who the intended audience is (expert or popular,) or a source can be categorized according to its scope (a small piece of a topic or a synthesis of a whole field.) But there are many, many ways to categorize sources, and when it comes to figuring out whether or not or how to use a source, some categories are more useful than others. Here are some we will consider in this chapter:

- **Format**: What does the source look like? (ex: books, periodicals, videos, etc.)
- **Creator**: Who created the source? (ex: governments, journalists, researchers, etc.)
- **Gatekeeping**: What controls were used in the creation of the source? (peer-review, editorial control, etc.)

Knowing what sources exist is a key step on the way to gaining perspectives of others. From the Habits of Mind chapters you might remember that every message is created and received within a cultural and historical context. Understanding how messages are created and by whom will help us understand their context.

Format

One of the most common ways we talk about different kinds of sources is their format. Print vs online is one way to categorize sources by format, but other common format categories include:

- **Books**: includes categories like **encyclopedias**, **anthologies**
- **Periodicals**: includes categories like **newspapers**, **magazines**, & **scholarly journals**
- **Websites**
- **Videos**

As you can see, even when we categorize sources by their format, there's no one right way to do it. (Also, any book or periodical can be available in either print or online, so the print and online categories aren't very useful.) Because many different kinds of creators can create a source in any format, format isn't a particularly useful characteristic in evaluating a source. Knowing the format also doesn't tell you anything about the gatekeeping that was used in its creation.

Format *is* useful when you're deciding where to search. As we'll discuss in the next chapter, Access & Searching, you would likely use a different search platform to find a book than you would to find an article from a periodical.

Another way that the idea of format can be useful is by knowing what kinds of information tends to show up in what kinds of formats. Information about very recent events will show up first in daily or weekly periodicals like newspapers and magazines, or on frequently updated websites.

Information about recent research discoveries will show up first in monthly, quarterly, or annual periodicals, like scholarly journals. Some scholarly articles also analyze current events, but because scholarly publishing is slower than newspaper publishing, you won't find a scholarly article about something that happened last week.

Some time after an event or discovery has been reported in one of these places, it may start to show up in books. Books are more likely to synthesize many events or research findings into a bigger narrative, which takes longer to write and publish than articles in periodicals. But the bigger picture that can be found in books is very valuable, one reason why we suggest consulting encyclopedias during preliminary research.

Creator

Yes, on some level, all sources are created by an individual sitting down and doing work. But many times those individuals are doing that work in the course of their jobs and under the direction of a larger entity or according to the norms and expectations of a certain community.

Governments

Don't confuse governments with politicians. Hundreds of thousands of people work in various United States federal agencies, from the Department of Agriculture to NASA. Thousands more work on the state and local levels of government. Unlike elected officials, most of these workers apply for their jobs in much the same way employees in the private sector do. Not everyone working in government is focused on getting re-elected.

The amount of information produced by governments is enormous, and much of it is high quality information that is not or could not be gathered by any other entity. Once place to search for United States government data is at Data.gov

> To discover what kind of government information is available on your topic, try using the site limiter in Google. After you type in your search terms in Google, add *site:.gov*. This limits your search results only to websites with the .gov domain.

For-profit Companies

A company might be selling a product, a service, or both. Just because there is a profit motive involved doesn't mean you have to immediately discount any information produced by a for-profit company. But it is important to understand the relationship between the information they produce and the way they make their money. For example, it is reasonable to be skeptical of claims about vitamins and supplements made by the companies that profit from selling them.

Non-profit Organizations

This covers a lot of ground, but just as we shouldn't immediately discount any source from a for-profit company, we shouldn't automatically accept information produced by a non-profit. In many cases, what a non-profit is "selling" is a certain idea or ideology. The stated mission of the organization can tell you a little bit about an organization, but it is also important to look for what others are saying about the organization. There are many different kinds of non-profits, but there are two kinds in particular that are likely to come up as you research your wicked problem: professional associations and interest groups.

Professional Associations

A profession is a job that requires a particular kind of training in a field that has its own standards and rules. People in nearly every profession come together to form professional associations, including plumbers (Plumbing-Heating-Cooling Contractors Association), meteorologists (American Meteorological Society), and social workers (National Association of Social Workers.) Sometimes a profession is so large that it has more than one professional organization (dentists have at least 10.)

Some professional associations may administer tests to make sure people are qualified to practice a profession. For example, lawyers must pass a test set by their professional organization, the American Bar Association, in order to practice law. These associations don't just exist to test people trying to enter their professions; they also exist to help people working in them continue to learn, to network and share information with each other, and to advocate for the best policies in their areas of expertise. They can be really good sources of information related to their particular disciplines.

Special Interest Groups[1]

Special Interest Groups, also known as advocacy groups, use various strategies to influence public opinion and ultimately policy. They may exist to advance particular political, religious, moral, or commercial positions. For example, both the National Rifle Association and the Brady Campaign both exist in order to promote certain perspectives on firearms.

Groups use varied methods to try to achieve their aims, including lobbying, media campaigns, publicity stunts, research, and policy briefings. Some groups are supported or backed by powerful business or political interests and exert considerable influence on the political process, while others have few or no such resources.

Information produced by special interest groups is a mixed bag. Unlike professional associations, there's no guarantee that the information they produce is coming from experts, and we certainly shouldn't expect them to produce a balanced overview of a topic. At best they can present a good articulation of the opinions related to one perspective on an issue. At worst they can spread false or misleading information in order to advance their policy goals. Special interest groups are not the best sources for facts or data.

One thing to be aware of is a practice known as **astroturfing**. Sometimes for-profit companies try to make it appear as though their messages are coming from community-organized, grassroots special interest groups by creating and

1. Content in this section is adapted from the Wikipedia entry "Advocacy Group" (https://en.wikipedia.org/wiki/Advocacy_group) and is used under a CC BY-SA 3.0 license.

funding non-profit organizations. Just as with for-profit companies, it's important to find out the relationship between a special interest group's funding and its goals.

Journalists

Journalism refers to the gathering and publishing of information about current events or issues relevant to a society. A journalist may work for a for-profit or non-profit organization, but what defines journalism is adherence to a particular set of norms and expectations. The Society of Professional Journalists (another professional association) maintains a Code of Ethics for journalists to follow, but many news organizations also develop their own professional and ethical guidelines. In the chapter Evaluating News Sources, we go into more detail on these practices.

Academics & Researchers

This is another group that is bound by a particular set of expectations and standards. Academic research culture is very much about intellectual honesty, careful research methods, and peer-review in the pursuit of new knowledge. This is also a community that takes plagiarism very seriously (this is one reason your professors will hold you to a high standard with respect to citing the works you have used in your research.) As we saw in the field of journalism, academic publishing has ethical standards, such as the Committee on Publication Ethics' Core Practices. Individual researchers are also guided by a number of research standards, such as the American Institutes for Research's Code of Conduct.

> If you decide to conduct research around your wicked problem that involves human subjects, there are standards you will need to learn about. These are addressed in another chapter, Research on Humans.

Individuals

Sometimes people do act on their own to create and share information, even when it isn't their job to do so. We share information about our hobbies, our areas of interest, special skills or knowledge we have developed, and our personal experiences. One of the most powerful changes the internet brought was the ability for people to publish their personal experiences and narratives without having to be part of a formal organization. There are some kinds of information that is most likely to be created by individuals working on their own. For example, if you want to hear about the experiences of a certain group told from their own perspective, individual narratives are ideal.

This is a broad category that contains both sources created by well-meaning individuals and concerned experts as well as angry, uninformed individuals with axes to grind. It is wise to learn a bit about an individual creator before you decide how to use the information they have provided.

> Individuals may have expertise or special knowledge that is not written down or published anywhere. If you are working on a project that relates to a particular local community, it is likely that some of the information you want exists only privately or in the heads of people working in that community. Who would you talk to locally about your

topic? What kinds of info that is relevant to might not be discoverable any other way?

Gatekeeping

Like a guard who stands at a gate and only lets some people through, some sources are created using processes that only allow some information through. Different kinds of organizations will use different mechanisms to filter and improve the information they produce. There are almost as many creation processes as there are outlets and publications, but there are some gatekeeping processes that come up over and over again.

Editors

Editors work for book and periodical publishers and even sometimes for websites and blogs. An editor may make decisions about which pieces to publish or commission articles or books on certain topics. An editor may also offer feedback on the content and make sure that the content also goes through different types of review (like fact checking or peer review, both described below.)

Editors often have the final responsibility to make sure the codes of ethics or conduct mentioned above are followed by everyone working at a publication. Even Wikipedia has editors, people with solid knowledge of the rules and norms of the community, who are given particular power to determine who can edit and settle disputes.

Credentials

Sometimes people aren't invited to contribute content to a source unless they have a particular kind of credential: a certain degree or certification or hold a certain position. In most cases this determination is made by the editor. For example, scholarly journals are unlikely to publish works by authors who do not have an advanced degree (completed or in progress) in the subject on which they are writing (even when this isn't an official policy of the journal it is usually true in practice.)

Peer Review

Peer review refers to the practice of having a work evaluated by others in that field. Usually this involves a collaborative process where the individual authors and the reviewers come to an agreement about what changes should be made to improve the work. In some cases, a reviewer may decide that a work is so flawed that they recommend it not be published.

Peer review of scholarly articles can take a long time and is one reason that scholarly articles takes so much longer than newspaper or magazine articles to get published. But peer review is a process that very much embodies the idea of scholarship as a conversation.

Fact-Checking [2]

Fact checkers verify that the names, dates, and facts in a work (usually an article or book) are correct. For example, they may contact a person who is quoted in a proposed news article and ask the person whether this quotation is correct, or how to spell the person's name. Fact-checkers are primarily useful in catching accidental mistakes.

The number of people employed in fact-checking varies by publication. Some organizations have substantial fact-checking departments. Others may hire freelancers per piece, or may combine fact-checking with other duties. Magazines are more likely to use fact checkers than newspapers. Television and radio programs rarely employ dedicated fact checkers, and instead expect others, including senior staff, to engage in fact-checking in addition to their other duties.

> In this context, we are talking about fact-checking that is done before a source is published. Over the last two decades there has been an increase in fact checking as an activity that takes place after a source has been published, a practice discussed in more detail in the chapter, SIFTing Information.

Domains

The top level domain of a website refers to the last two or three letters in the url, for example .com (short for commercial) or .mil (short for military.) Some top level domains are closed to general use, for example, in order for a website to have a .edu domain, a college or university must be accredited by the US Department of Education. Similarly, .gov domains are only open to agencies of the federal, state, or local governments within the United States.

There is a common misconception that the .org domain is restricted to only non-profit organizations. The .org domain has always been the home for many non-profit websites, but this is not a requirement for the .org domain. Currently the .org domain is owned and managed by investment company, Ethos Capital, which puts no restrictions on who may register. Many well respected non-profit organizations do use the .org domain. However, astroturf organizations and hate groups capitalize on this misconception and often use .org domains to increase their appearance of respectability.

Using Creator & Gatekeeping to Describe a Source

Understanding the format, creator, and gatekeeping characteristics of a source will go a long way towards demystifying the information environment and helping you understand the context of the sources you encounter. Keep in mind that format, creator and gatekeeping are all independent of each other. Here are some examples of what that means:

- An academic or researcher may publish information in multiple formats, for example, a blog post and a scholarly article. Peer-reviewed articles can be excellent sources; they can also be challenging to read if you're not an expert in that area. In fact, many scholars do write blog posts about their scholarly work to try to make it accessible and understandable to a larger audience. The creation process for the blog may have no oversight, but that person is still an expert, and the blog post may be valuable to you in that it helps you understand the content in a way that would have been difficult with the scholarly paper. The creator is the same but the format and the gatekeeping are

2. Content in this section is adapted from the Wikipedia entry "Fact-checking" (https://en.wikipedia.org/wiki/Fact-checking) and is used under a CC BY-SA 3.0 license.

different.

It's usually not hard to tell a vanity press from their website or from a quick Google search of their names. If they charge the author to print the book, (instead of paying the author and charging the readers,) it's a vanity press.

- A book can come from an academic press with a lot of editorial control, fact-checking, and peer review or it can be self-published by a "vanity press," that publishes books on demand. Or it can come any number of non-academic book publishers with any number of other unique criteria. The format is the same in each case, but the gatekeeping is very different.
- Anyone can start a blog for free (and it's not even hard to make it look professional), so some blogs are no more or less valuable than the expertise or perspective of the individual writing them. But some blogs are run by editors who carefully select authors to be invited to contribute blog posts, and those posts may also be subject to some sort of review before they are posted. This is common for blogs associated with professional organizations. In those cases you can have the added confidence that the author of the blog post is someone that the editor believes to have useful expertise on the topic. The format (blog post) is the same in both cases, but the creation processes are different.

A Note About Social Media

Social media is not a type of source; it is a way that a source can be shared and distributed. A post on social media can come in a variety of formats, can originate from any kind of creator, and may or may not involve gatekeeping. Someone could just as easily post a link to a peer-reviewed journal article or to a video produced by a special interest group.

Reflection & Discussion Question 1: Interest Groups vs Professional Organizations

Professional organizations tend to be well respected sources of information because of the level of expertise of their members. Sometimes interest groups try to look like professional associations to appear more credible. For example, one of the groups below is a professional association and one of them is by an interest group.

American College of Pediatricians

American Academy of Pediatrics

- Can you tell which is which?
- What information was most useful in determining the answer? What strategies did you use to figure it out?

If you thought this question was hard, you're not alone. This example was used in a recent study, and both undergrads and professors struggled with the answer, but professional fact checkers did not. In another chapter,

SIFTing Information, we discuss some of the strategies used by fact checkers that make this kind of question easy.

Reflection & Discussion Question 2: Special Interest Group Funding

Above, we mentioned the practice of astroturfing, where for-profit companies produce information that on the surface appears to be coming from grassroots, community movements. Use Google (or your preferred search engine) to see what can you find out about the funding of the organizations below. For each organization say whether or not you think it is an example of astroturfing and why.

(Sometimes searching the organization name and the word *funding* turns up interesting results.)

- Center for Consumer Freedom
- National Consumers League
- One Fair Wage
- Save Our Tips

Reflection & Discussion Question 3: Domain Searches

There is an easy way to limit your Google search results to only certain domains. By adding site: to the Google search box along with your search terms, whatever you type after the colon will appear in the url of all the results. For example, site:.edu only returns only higher education webpages. You can even include more of the url to limit your search even further. site:concordmonitor.com will return only pages from the Concord Monitor newspaper website.

- Use the site limiter in Google to find a government webpage on your topic.
- Identify the web address of your hometown's local newspaper or television news station. Use this information and the site limiter in Google to find out if they have ever done a story on your topic.

Reflection & Discussion Question 4: Gatekeeping

Select one of the forms of gatekeeping described above.

- Describe how this process can improve the quality of a source.
- Describe a situation where that process excludes certain perspectives.

In This Chapter

Learning Objectives

- Understand the limitations of the open web and how to use catalogs and databases to compensate for those limitations
- Understand how to use search terms when seeking information

Summary

While they return an impressive number of results, search engines like Google are unable to show us content from the deep web. A main function of libraries is to provide access to content not available on the surface web that represents important parts of the conversation about your wicked problem. In both Google and library searches the search terms we select can have a huge impact on what we find.

Limitations of Google and the Open Web

It may feel like Google, with it's millions of results for even the most trivial search, is serving us the entire universe of information. But Google, or any search engine, is only able to retrieve results from the surface web, the part of the web easily accessible through any search engine.

There are a variety of ways to keep a website inaccessible to Google and a variety of reasons someone might want to. Your email and online banking information are set behind login screens because that information is sensitive and private. Websites where illegal activity is taking place (the dark web, which is only a small part of the deep web) can require particular browsers or authorization in order to remain hidden from law enforcement. But the most relevant situation for the purposes of researching a wicked problem is when content is valuable enough that it is put behind a paywall and accessible only to those who are willing and able to pay. This includes streaming video sites like Netflix, some newspapers, magazines, and journals, and most books.

Think about the gatekeeping processes discussed in the Types of Sources chapter. A lot of these processes are time intensive and cost a good deal of money. Sources that have gone through a careful process of creation are likely to be both high quality and behind a paywall so that the costs of production can be recovered. If it's good enough that some people would pay for it, the creator probably isn't going to give it away for free on the internet.

> The word *Google* has come to mean any search engine or even to refer to the act of searching itself. In this section, when I say *Google*, I really mean any web search engine. But Google certainly isn't the only one. If you are concerned about the amount of data that Google is collecting about you, try using DuckDuckGo, a privacy-centered search engine that doesn't collect any user info.

Think about that: as much as Google can show you, it tends to be the best, most carefully created information that you cannot get for free on the web. (I say "tends to be" because you may also remember from the previous chapter that there are no hard and fast rules about determining the quality or usefulness of information. Some creators give away high quality information, and some charge for questionable content.)

Libraries & Access

If you want to participate in the conversation about a wicked problem, many important parts of that conversation may not be available on the surface web. Happily, one of the main functions of libraries is to provide access to information not freely available elsewhere. They do this both by buying print versions of sources and by buying subscriptions to portions of the deep web that are otherwise paywalled.

> Google Scholar is another example of a free, surface web database. It is a collection mostly of peer-reviewed articles. Perhaps the most useful part of Google Scholar is that it can locate open access copies of otherwise paywalled articles; pay attention to the links in right hand column of the search results – this is where the open copies are.

The way you can discover what materials the library provides access to is by searching the library databases. A **database** is an online collection of material – it can be a collection of anything really: ebooks, articles, videos, songs, images. Some databases are available on the surface web and can be used for free. Google itself is a database, one that contains links to websites.

Many databases are part of the deep web, meaning they are behind a paywall or require authentication to access. Each library chooses the databases that are most relevant to their communities and pays for access to those on behalf of their community. By using login credentials to limit who can access these databases, libraries make available deep web content that Google can't show you. At PSU, our library makes available over one hundred databases. For example:

- Academic Search Premier: One of our largest databases, contains a mix of scholarly and popular articles on a wide variety of topics.
- PsycArticles: A smaller database that contains only scholarly articles about psychology-related topics.
- CQ Researcher: A database of hundreds of expert reports on current events, society, and world affairs.
- Gale Ebooks: (mentioned in previous chapter) Online reference books, including encyclopedias, covering most subject areas.
- Naxos Music Library: A collection of over a million classical music tracks.

As you can see, some databases focus on a particular subject area, and some focus on a particular format. It's a lot to keep track of, and you don't need to memorize what each of these databases is good for. You can always ask a librarian or use the Subjects menu on the database list page to see which databases are recommended for your subject.

The **library catalog** is also a database, but this database is a special case. A library catalog is a database that is built by each individual library and is unique to that library. It contains records of all of the materials physically located in a particular library and their locations and call numbers. The big search box you see when you come to the Lamson Library home page is how you can search our particular catalog. The material in the catalog is mostly books, and although it can also show you some of the online sources that are in our other databases, we recommend searching the other databases for the best search experience.

Search Terms

Take a look back at the example from the chapter Our Mental Shortcuts, where we found that different search terms related to the same concept can yield very different results. There are many tips and tricks for improving your search results and finding more of what you want, but the most important skill is choosing search terms.

Identifying Main Concepts

It is very useful to be able to state what information you are looking for in the form of a question. Many times we think we know what we want, but when we try to put it in the form of a question, we find out our ideas are a bit vague. Before you start typing anything into a search box, check that you can phrase what you're looking for as a question.

Once you have articulated a question, look at it closely and try to find the main concepts that make up your question. These concepts are going to be the key to finding good search terms. For example, if you want to know,

What can employers do to prevent their employees from burning out?

There are really three concepts there: *employers*, *prevention*, and *burnout*. If you just searched for the concepts *employers* and *burnout*, you might get information about how employer practices that contribute to burnout. If you just used *burnout* and *prevention*, you might get information about what employees can do avoid their own burnout. If you just used *employers* and *prevention*, you would probably get information about preventing workplace accidents. You need all three concepts to get at your question.

Don't Type the Whole Question

When using a search engine like Google, we can and often do just type in our entire question, and it works just fine. However, many other databases are much more literal. For example, in many of the databases libraries provide access to, if you a type in *What can employers do to prevent their employees from burning out?* the database will assume you only want articles that use all the words you typed in, including the unimportant words like *what*, *can*, and *their*.

Really, try this search in this database and see how lousy the results are. It assumes you want articles that use the words *burning out* and so it overlooks articles that use the word *burnout*. Now instead of the whole question, just search for the concept words *burnout employers prevention*, and see how much better the results are.

Identify Synonyms for Your Concepts

Another way to get better results is to think of synonyms for your search terms. There are always a bunch of different ways to say the same thing. For example we could address the same concepts involved in *burnout* by using words like *job stress* or*work life balance*. Or we could combine the word *employment* with the phrases *mental fatigue* or *emotional exhaustion*. If the first set of search terms you try doesn't work well, it doesn't mean there is nothing on your topic, it just means it's time to try some different words. Ideas for different ways to express your search concepts can come from the sources you read, from your discussions, or even from searching for synonyms in Google. Do yourself a favor and keep a running list of potential search terms as you're reading, discussing and searching.

> If you're stumped for different search terms, try describing your topic to a friend for 1 minute straight. Ask your friend to write down all the important nouns and adjectives you used while talking.

Using different synonyms for your concepts can help you find sources that approach your topic from a variety of different perspectives. For example the word choices of an expert who is writing a scholarly article may be very different from those of someone writing a casual blog post, even if they're about the same topic. Trying multiple searches using a variety of search terms will help us retrieve both perspectives from different groups. To find instances of people talking casually about their work

experiences, you might use search terms like *work*, *job* and *gig*, but to find works from a more academic perspective you might use search terms like *labor*, *employment* and *occupations*.

Narrow Your Scope

Coming up with search terms is closely related to finding the question that you want to focus on. Very often the first questions we ask turn out to be too broad, but they lead us to narrower, more focused questions. For example, the question *What can employers do to prevent their employees from burning out?* is actually enormous. After reading about all the many ways employers can help prevent burnout in their employees (adjust workplace culture, employee assistance programs, work from home options, etc.), you may choose to focus on just one, maybe the impact that increasing vacation time has on burnout. As your question changes so will your search terms. (Now try searching *vacation burnout*. There are far fewer results, but they are very relevant to the topic.)

Reflection & Discussion Question 1: Access to Research

One significant category of deep web content is scholarly, peer-reviewed research articles. Not all, but a great deal of research is accessible only to those who can afford the articles charges (usually between $30 and $50 per article) or who are affiliated with a well-funded research library. Read the article 'It's a Moral Imperative:' Archivists Made a Directory of 5,000 Coronavirus Studies to Bypass Paywalls (approximately a 5 minute read) and consider the questions below.

- What do you think about the illegal activity described in the article?
- Some journal publishers were motivated to remove the paywalls on COVID research by of the serious, worldwide nature of the pandemic. To what extent is COVID research different than research on other diseases? When is an issue important enough to give everyone access to the research?
- How would your answer change if I told you that the authors of research papers are not paid by the journal for their content? (Researchers do in fact give the articles to the journal for free.)
- In some cases, the research described in scholarly papers is funded by tax payer dollars. Should those papers be behind a paywall?

Reflection & Discussion Question 2: Search Concepts

In the chapter on identifying a topic, we talked about jotting down notes, collecting the interesting information from each source and asking questions about it. If you have some notes, now is a good time to take them out.

- First, identify one question that you have from your notes. Don't just think about the question, but make sure that you know exactly what it is by writing it down.
- Second, look at your question and identify all the main concepts that make up your question. Most questions have between 2 and 4 main concepts. Write these concepts across the top of your paper.
- Next, for each concept, try to identify at least three synonyms, and write them under the concept. Not every concept has synonyms, for example individual's names are unique, but most concepts can be talked about many different ways.

If you get stumped on any part of this, work with a partner to get unstuck. Still stuck? Try asking a librarian – this is one of the most common questions we get so we've got a lot of practice.

Reflection & Discussion Question 3: Comparing Databases

Now that we have a variety of different search terms to try, let's use them.

- Select a database from the list below and explore it using the search terms you generated in question 2.
- Now try those same search terms in another database or in the PSU library catalog.
- Think about the types of sources we've discussed in earlier chapters. How would you describe the formats, creators, and intended audiences of the search results in each database? How were the sources different?

- Academic Search Premier
- CQ Researcher
- Ebook Academic Collection
- Newspaper Source
- Statista

Reflection & Discussion Question 4: Access to Research

Your access to the databases discussed above is tied to your myPlymouth login. Once you graduate, you will not be able to access many of the databases above. (The library pays for them based on how many people have access, and we just can't afford to cover alumni access to most of our databases.) Read the article, You're a Researcher Without a Library: What Do You Do? (approximately a 15 minute read) about navigating the research world after college.

- Why do you think we even talk about these databases if you might not have lifelong access to them? Do you think we are right to teach you about them?
- Which of the strategies in this article do you think you're most likely to use after college?

- In what ways will the research skills you learn and practice in college be useful after college?

Note: Lamson Library, like nearly all college and university libraries, is a public building. Even when you're not enrolled, you are welcome to come inside and use our resources within the building, including our online journals and databases.

In This Chapter

Learning Objectives

- Learn strategies for quickly evaluating the sources and information you find

Summary

Whenever a source provokes a strong positive or negative feeling, that's a sign to check the information. There are a variety of ways to check information: by learning more about the source, learning more about the claim, or finding the original source of the information. You don't have to do all of these steps every time. Choose what is most likely to help you put the information into context.

SIFT Method

In the last two chapters we talked about what kinds of sources are out there and how you might find them. Now let's talk about how you can evaluate the sources you find. In the Introduction chapter we said that even though there is a lot of competing information out there, it is possible to move closer to better information (even if finding the absolute truth is a big and elusive project). This chapter outlines four "moves" that will help you do this.

These moves are about using the whole web to figure out what type of source you've got or the accuracy of a statement. This may be quite different than what you have heard in other information literacy lessons. Looking around the web isn't "cheating," it's taking advantage of the most powerful tool you have. If we only use the information from the source itself, we risk being misled by that source or by our own existing opinions on the topic.

Here is a helpful acronym to help you remember the four moves: S.I.F.T.:



1

These are four things you might do as you try to move towards better information. This is not a checklist. You don't need to do all of these things every time you're evaluating information, and you may want to try a couple but in a different order than this. You can use whichever ones make sense in a particular situation.

> In these chapters we're focusing on researching a wicked problem, but the SIFT method is a great thing to use before you share information on social media. Often we feel compelled to share the things that evoke the strongest feelings, but those strong feelings are a good sign that those things need to be checked before they are shared.

Stop

Check your emotions. If a claim causes strong emotion — anger, glee, pride, vindication — STOP. You must fact-check this claim. Remember from the chapter, Our Mental Shortcuts, that we more readily accept information that confirms our beliefs (confirmation bias) and we tend to think less critically about that kind of information than we do about information that challenges our beliefs (motivated reasoning.) A strong emotional reaction is a sign that these cognitive biases are at work. Remember, these mental shortcuts don't make us bad people, we all have them. But we do need to account for them if we want to move toward better information.

In addition, if you get lost while working on the other moves, or hit dead ends, or find yourself going down an increasingly confusing rabbit hole during your investigation, STOP. Back up and start over knowing what you know now. You're likely to take a more informed path with different search terms and better decisions.

Investigate the source

The key idea here is to know what you're reading before you read it. This doesn't mean you have to do a Pulitzer prize-winning investigation into a source before you engage with it. But if you're reading a piece on economics by a Nobel prize-winning economist, you should know that before you read it. Conversely, if you're watching a video on the many benefits of milk consumption that was put out by the dairy industry, you probably want to know that as well.

This doesn't mean the Nobel economist will always be right and that the dairy industry can't ever be trusted. But knowing the expertise and agenda of the source is crucial to your interpretation of what they say. Taking sixty seconds to figure out where it is from before reading will help you decide if it is worth your time, and if it is, help you to better understand its significance and trustworthiness.

Read what other people say about the source, (publication, author, etc.) Take a look back at the list of creator types from the chapter, Types of Sources, and remember that some of them may try to disguise their content as though it were from a different kind of creator (for-profit companies engaging in astroturfing or interest groups trying to look like professional organizations.) So the best way to figure out the truth about a source is to **leave that source**. You have the whole internet at your disposal, so don't only read what the source says about itself, instead find out how others view that source. The truth is in the network.

1. SIFT image from the Arizona State University News Co/Lab, https://mediactive.newscollab.org/part-one/sharing-with-integrity/

Find better coverage

Sometimes you don't care about the particular article that reaches you. You care about the claim the article is making. You want to know if it is true or false. You want to know if it represents a consensus viewpoint, or if it is the subject of much disagreement.

In this case your best strategy is to ignore the source that reached you and look for other trusted reporting or analysis on the claim. In other words, if you receive an article from the Save the Koalas Foundation that says koalas have just been declared extinct, the best strategy may be to open up a new tab and find the best source you can that covers this, or, just as importantly, scan multiple sources to see what the consensus seems to be. In these cases we encourage you to find coverage that better suits your needs — more trusted, more in-depth, or maybe just more varied.

Look around to see if someone else has already fact-checked the claim or provided a synthesis of research or provided coverage that gives more useful information about the claim or the context of the claim. Your first move might be to look to see if sites like Politifact, or Snopes, or even Wikipedia have researched the claim. But if you don't find any information there, try Googling the key words about the story you want to check.

Trace claims, quotes, and media back to the original context

A lot of things you find on the internet have been stripped of context. Maybe there's a video of a fight between two people. But what happened before that? Who started it? What was clipped out of the video and what stayed in? Maybe there's a picture that seems real but the caption is dubious at best. Maybe a claim is made about a new medical treatment supposedly based on a research paper — but you're not certain if the paper supports it. By tracing the claim, quote, or media back to the source, you can see it in its original context and get a sense if the version you saw was accurately presented.

If the claim is about research, can you find the original journal article written by the folks who actually did the research? The source may mention the names of the researchers involved, the title of the journal the work was published in, the title of the study or the year it was published. If you have any of these pieces of information, you can try putting them in to Google Scholar, or even use Google Scholar's Advanced Search features.

If the claim is about an event, can you find the news publication in which it was originally reported? Look at where the event took place and see if you can find a local newspaper for that area. Then search that newspaper's site for coverage of the story.



One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://pressbooks.usnh.edu/wickedproblem/?p=52#oembed-1

It's About REcontextualizing

There's a theme that runs through all of these moves: it's about getting the necessary context to read, view, or listen effectively. And doing that first.

One piece of context is who the author or publisher is. What's their expertise? What's their agenda? What's their record of fairness or accuracy? So we investigate the source. Just as when you hear a rumor you want to know who the source of it is before reacting to it, when you encounter something on the web you need the same sort of context.

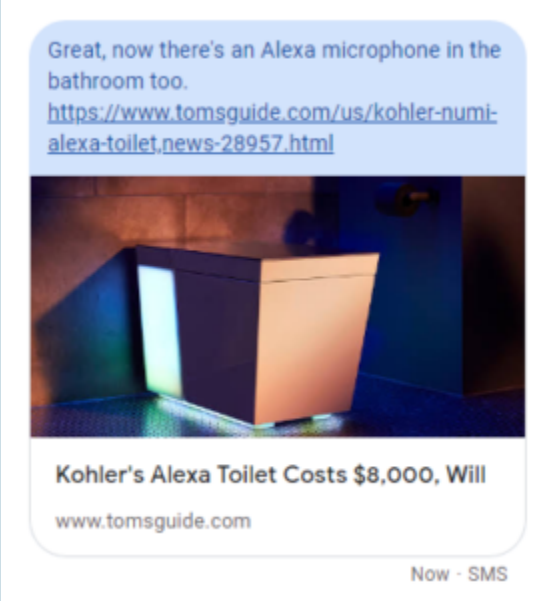
When it comes to claims, a key piece of context includes whether they are broadly accepted or rejected or something in-between. By scanning for other coverage you can see the expert consensus on a claim, learn the history around it, and ultimately land on a better source.

Finally, when evidence is presented with a certain frame — whether a quote or a video or a scientific finding — sometimes it helps to reconstruct the original context in which the photo was taken or research claim made. It can look quite different in context!

In some cases these techniques will show you claims are outright wrong, or that sources are legitimately "bad actors" who are trying to deceive you. But even when material is not intentionally deceptive, the moves do something just as important: they reestablish the context that the web so often strips away, allowing for more fruitful engagement with all digital information.

Reflection & Discussion Question 1: Investigate the Source – Alexa Toilet

Imagine that a friend sends you a text about a new "Alexa Toilet":



That links to this page: https://www.tomsguide.com/us/kohler-numi-alexa-toilet,news-28957.html

- Using the Investigate the Source move, try to figure out if Tom's Guide is a known product review site or something else.

Reflection & Discussion Question 2: Investigate the Source – Alligator

Check out both of these news reports and answer the questions below.

1. https://abcnews4.com/news/local/granddaughter-of-90-year-old-woman-killed-by-alligator-sues-west-ashley-nursing-home
2. https://kdvr.com/2016/07/29/90-year-old-woman-killed-by-alligator-at-south-carolina-nursing-home/

- Are these trustworthy news sources for this sort of story?
- Is this story likely true?
- If you had to pick the best source of the two based just on what you found on Wikipedia, which one would you pick, and why?

Reflection & Discussion Question 3: Investigate the Source – Volcano Plane

Take a look at this story and answer the questions.

https://worldnewsdailyreport.com/malaysia-airline-flight-forced-into-emergency-landing-after-flying-over-icelandic-volcano/

- What sort of source is this?
- How do you know?

Reflection & Discussion Question 4: Find Better Coverage – MH17

For this exercise, you'll need a bit of background. MH17 was a passenger plane shot down by Ukrainian separatists. Take one minute to watch this short video on the history of the crash.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.usnh.edu/wickedproblem/?p=52#oembed-2

Looking only at issues around the source (**and not the article itself**), which of the following publishers is a better source on the downing of MH17 and why?

- https://www.reuters.com/article/us-ukraine-crisis-mh17/russians-ukrainian-to-face-murder-charges-over-downing-of-flight-mh17-idUSKCN1TJ30G
- https://youtu.be/WEvUHfjS3Ig

Reflection & Discussion Question 5: Find Better Coverage – UN Dance

Early in 2018 the Trump administration announced that it would withdraw financial support for Palestine unless the country agreed to concessions. U.S. Ambassador Nicki Haley presented the U.S. position on the matter to the U.N. in January.

Then, according to many people on Twitter, something amazing happened. In defiance of the Nicki Haley's pronouncement, the Palestinian delegation got up… and began to dance!



Fact check this, then answer the following questions:

- Is the video unaltered (i.e., a "real" video)?
- Is this video really a reaction to U.S. Ambassador Nikki Haley?

- What else can you tell us about this video, and how do you know it?

Reflection & Discussion Question 6: Original Context – Sunscreen

Look at the tweet below, then find and read the original source of the information.

> It might be time to ditch the sunscreen. https://t.co/448LHHb6bc
>
> — John D'oh (@citizenkeene) August 6, 2019

- Do you feel that the tweet accurately represented the information in the original source? Why or why not?

Note: *This chapter is derived from the material in the Check, Please! Starter Course. The canonical version of this course exists here, which is the version written by Mike Caulfield. Other versions of this course may exist online, edited by others, and that's great, but click the above link if you want the original.*

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In This Chapter

Learning Objectives

- Understand the difference between news gathering and news analysis
- Know what processes are likely to contribute to the accuracy of a news source
- Understand the difference between bias and agenda

Summary

News organizations participate in two separate activities: gathering and checking facts and creating a narrative based on those facts. You may find one source very accurate, but not like its narrative or vice versa. Journalism standards and ethics outline particular sets of practices that help promote accuracy within a news organization. Agenda refers to the primary mission of an organization and tends to have a bigger impact on accuracy than the bias of an organization or its workers does.

News Gathering vs News Analysis

Evaluating news sources is one of the more contentious issues out there. People have their favorite news sources and don't like to be told that their news source is untrustworthy.

For fact-checking, it's helpful to draw a distinction between two activities:

- **News gathering**, where news organizations do investigative work–calling sources, researching public documents, and checking and publishing facts (e.g. getting the facts of Bernie Sanders' involvement in the passage of several bills)
- **News analysis**, which takes those facts and strings them into a larger narrative, such as "Senator Sanders an effective legislator behind the scenes" or "Senator Sanders largely ineffective Senator behind the scenes."

Most newspaper articles are not lists of facts, which means that outfits like the Wall Street Journal and the New York Times do both news gathering and news analysis in stories. What has been lost in the dismissal of the New York Times as liberal and the Wall Street Journal as conservative is that these are primarily biases of the news analysis portion of what they do. To the extent the bias exists, it's in what they choose to cover, to whom they choose to talk, and what they imply in the way they arrange those facts they collect.

The reputation for fact checking is largely separate from the reputation for a certain kind of analysis. MSNBC, for example, has a liberal slant to its news, but a smart liberal would be more likely to trust a fact in the Wall Street Journal than a fact uttered on MSNBC because the Wall Street Journal has a reputation for fact-checking and accuracy that MSNBC does not. The same holds true for someone looking at the New York Observer vs. the New York Times. Even if you like the perspective of the Observer, if you were asked to bet on the accuracy of two pieces–one from the Observer and one from the Times–you could make a lot of money betting on the Times.

Narratives are a different matter. You may like the narrative of MSNBC or the Observer–or even find it more in line with reality. You might rely on them for insight. But if you are looking to validate a fact, the question you

want to ask is not always "What is the bias of this publication?" but rather, "What is this publication's record with concern to accuracy?"

Many news organizations produce two kinds of pieces, news reports and editorials. It is important to note the difference. Any news source that produces both of these types of articles should have two separate departments, a newsroom and an editorial room, run by different editors with different staffs. The articles from the newsroom are subject to journalistic codes of ethics, while editorials only need to be approved by the editor of that department. Editorials are often where the narrative offered by a particular news source is most obvious. These two types of pieces should be clearly labeled, but often they are not, contributing to confusion about the separate news gathering and news analysis functions of news organizations.

Markers of Accuracy

You may remember from the chapter Types of Sources that journalism standards and ethics are expectations and practices which journalists should adhere to. The Code of Ethics by the Society of Professional Journalists is an example of these, but individual organizations may develop their own sets of practices. What characteristics and practices of a news source tend to result in accurate coverage?

- **Machinery of Care**: Good news sources have significant processes and resources dedicated to promoting accuracy, and correcting error.
- **Transparency**: Good news sources clearly mark opinion columns as opinion, disclose conflicts of interest, indicate in stories where information was obtained and how it was verified, and provide links to sources.
- **Expertise**: Good news sources hire reporters with reporting or area expertise who have been educated in the processes of ethical journalism. Where new writers with other expertise are brought in, they are educated by the organization.
- **Agenda**: The primary mission of a good news source is to **inform its readers**, not elect Democrats, promote tax cuts, or reform schools. You should absolutely read writers with activist missions like these, but do not treat them as "pure" news sources.

Bias vs Agenda

Students often come to media literacy thinking that the primary thing they should be concerned about is bias. And since everyone has some form of bias, that ultimately leads to students thinking no one can really be trusted.

Personal bias has real impacts. But bias isn't agenda, and it's agenda that should be your primary concern for quick checks.

- **Bias**: an inclination for or against a particular idea
- **Agenda**: the primary mission of an individual or organization

It's easy to see bias in people you disagree with, and hard to see bias in people you agree with. But bias isn't agenda. Bias is about how people see things; agenda is about what the news source is set up to do.

"Inform readers" is an example of an agenda. "Promote political party X" is also an example of an agenda. It matters what the primary goal of a source is. A news organization that clearly marks opinion columns as opinion, employs dozens of fact-checkers, hires professional reporters, and takes care to be transparent about sources,

methods, and conflicts of interest is less likely to be driven by political agenda than a site that does not do these things. And this holds even if the reporters themselves may have personal bias. Good process and news culture goes a long way to mitigating personal bias.

Again, we cannot stress enough: you should read things by people with political agendas. It's an important part of your information diet. It's also the case that sometimes the people with the most expertise work for organizations that are trying to accomplish social or political goals. But you should be aware of the agenda of the source you're reading; ask first and foremost when approaching an organization or source, "What is this group set up to do?" Keep in mind when checking a fact or a statistic that agenda can get in the way, and you may want to find a less agenda-driven source if possible.

If you did exercise 1 in the chapter Types of Sources, you saw this concept at work with the American College of Pediatricians. The main issue was not that the organization was biased, or even that it was small (though this mattered somewhat). The main issue was that it didn't seem to be set up as a research or professional organization. It seemed, in fact, to be set up as a political advocacy organization.

Reflection & Discussion Question 1: Journalism Codes of Ethics

Many journalism standards exist, including the SPJ's Code of Ethics mentioned above, but there is also a Code of Ethics by the National Press Photographers, and major news organizations like the New York Times publish their own guidelines on the ethical practice of journalism. Select one of the sets of guidelines above or locate a set of guidelines from another news organization and read it.

- How can we tell if a particular news source follows these guidelines? If we can't easily determine that on our own, what strategies could we use to get a sense of the reputation of a news source? Do any of the strategies from SIFTing information apply here?
- What practices seem especially important to promoting accurate news reporting and why?

Reflection & Discussion Question 2: Agenda – Smoke Free

Here's a summary of a report from an organization called Foundation for a Smoke-Free World. They want to eliminate smoking worldwide.

https://www.smokefreeworld.org/advancing-industry-transformation/global-trends-nicotine

Do a Google News search on the foundation name.

- Is there anything in particular we should know about this organization before reading their materials?
- Describe what you found out and what sources you used.

Reflection & Discussion Question 3: Identifying Opinion Pieces

Review the article, News or opinion? Online, it's hard to tell, about the challenges of telling news stories from editorials. Below are pairs of articles from different news sources. In each case, one article in the pair is a news story and the other is an opinion piece. For each pair determine which is which, and discuss how easy or difficult it was to determine this. What clues did you use?

- Washington Post: article 1, article 2
- NBC News: article 1, article 2
- Arizona Republic: article 1, article 2

This chapter was adapted from Web Literacy for Student Fact-Checkers and includes some content from the Check, Please! Starter Course, both by Mike Caulfield and both licensed under a Creative Commons Attribution License.

In This Chapter

Learning Objectives

- Make decisions about how to present your contributions to the conversation about your wicked problem.
- Cite the sources you've used in a way that makes sense for your context and audience.

Summary

Thinking about your audience will help you create work that effectively communicates your message. This is even true of decisions you make about citing your sources. Citation is a service to your audience that allows them to learn more about or verify your information. There are a variety of ways to cite sources depending on your audience and the format of your work.

Participating in the Conversation

It's likely that your first twelve years of schooling reinforced the idea that the only person you're doing your "school work" for is your teacher. Let's try and break the habit of thinking that way. Maybe you were really good at playing that game, or maybe it didn't work that well for you. Either way, that is not the only way to learn. The project-based nature of this class invites you to identify a problem that exists in the real world, find something real you can do about it and then find a way to share your contribution with other real people. This is where you start participating in the conversation about your wicked problem.

The analogy of a conversation is a good way to describe scholarship in general. All those scholarly articles, books and videos on your wicked problem are different voices in the same conversation, each one responding to the ones that came before it. Researching your wicked problem is like listening in on a conversation, one that has been going on a long time and won't ever finish. But instead of remaining a passive listener in this conversation, in this course you will contribute to the conversation.

We tend to think of the scholarly conversation as happening only in articles and books, but this isn't true. Creators, yourself included, can contribute their perspectives on an issue in a variety of ways. What matters is that you consider your audience when making decisions about how to share your work:

- What information is your audience likely to already know, and what is new to them (and will therefore need to be explained carefully)?
- What formats will work best for conveying information to that audience (text, video, audio, images, infographics)?
- Where does that audience go for information, and how can you put your message in a place that they will see or find it?
- How can you make your message sharable so that others can help your message spread?

Citation is for Your Audience[1]

It's not hard to imagine that thinking about your audience would affect decisions you make around the format and tone of your work. But it might be less obvious that you would consider your audience when deciding how to cite your sources of information. You may have been encouraged to think of citation as a very precise process of following all the rules related to one of the formal academic citation styles, like MLA or APA. Sometimes citation does mean that (like when your teacher or other academics are your whole audience), but this isn't the only possibility.

Consider what citation looks like in this blog post. Or in this video. In both cases the creators have enabled their audience to see where the information is coming from in a way that makes sense in that particular format.

Let's stop to consider what the point of citation even is. Apart from "I was told to," there are a few different angles. First, citation is a courtesy to your audience. They may be interested in or skeptical about a claim you're making, and if you give them enough information to find the sources you used, they can learn more about the topic, verify your information and make their own judgements about the credibility of those sources.

How frustrating is it when you want to know more about an interesting news snippet or listicle, but there is no link to or information about the original sources? If you want to get your audience on your side, it's best not to annoy them by failing to provide enough citation information.

A second reason to cite is the benefit to you. One way that audiences judge the quality of a piece is by the sources is it relying on for support. If your audience sees that you are citing sources that they themselves have confidence in, that reflects well on you and earns you some credit with them.

A final reason for citation is related to the idea of scholarship as a conversation. Providing citations to relevant previous sources is how you convey what earlier ideas you are responding to and is generally expected of participants in the conversation. If you're repeating something you originally heard from someone else, it is courteous to both your audience and the original source to say where it came from.

Citation should apply to any piece of information that is not common knowledge among your audience. Here is another reason to carefully consider your audience. Different audiences have different shared sets of knowledge. A group of zoologists will have a shared and detailed understanding of biological knowledge that is very different from what we would expect a group of non-experts to have.

Failing to cite the original source of information that is not common knowledge is known as plagiarism. Among academic audiences in particular, plagiarism is taken very seriously, which is why the syllabus for every course you will take at Plymouth State has a link to PSU's Academic Integrity Policy. Again, the context matters. In a casual conversation, no one assumes you are the original source of everything you say, even if you don't say where you originally heard it. But in an academic context, the convention is that if you don't cite the source of a particular piece of information you are saying that it is your original contribution.

Link Rot

What information do you need to provide your audience so that they can find your sources? You might think that just a link to the original source would be enough, but links break all the time. This phenomenon is known as link rot. The average lifespan of a link is around 2 years, according to a research paper written by Dennis Fetterly, A Large-Scale Study of the Evolution of Web Pages. See what I did there? I gave you enough information that you can check the source

1. Special thanks to Matt Cheney for sharing his citation teaching materials, on which this section was built. https://bit.ly/3BjNqT7

even though that link is broken. Good citation provides other pieces of information beyond the URL so that people can find the original source even after the link changes.

This information includes things like the name of the work, the date, the author's name, the name of the journal, magazine, newspaper it appeared in, or a digital object identifier (DOI). But depending on the format of the source you are citing, different information may be appropriate (like the director's name for a documentary or the title of a book that a chapter appears in).

Academic Citation Styles

All these different pieces of information are why citation styles like MLA, APA, and Chicago are so challenging. Each citation style has one right way of citing sources in every last format. This may seem like just an annoyance, but the idea is that someone could look at the citation and, just based on how it's written (capitalization, punctuation, italics, order of information, etc.) be able to tell whether it is a book, journal article, website, video, etc. Each little rule is a clue for the audience.

Why are there so many different academic citation styles? This also comes back to audience. Each style evolved within a different community, each of which cared about different things. For example APA (short for American Psychological Association) is often used in the social and natural sciences. In APA, the date is the second piece of information in the citation because in those fields new discoveries happen a lot and it's important to know when the research was done.

Compare that to MLA (short for Modern Language Association), a citation style used and developed within the humanities (language, literature, philosophy, art, etc.) which puts the date at the end. However in MLA you'll notice that the author's whole first name is spelled out, instead of just using a first initial as APA does. This is because in the humanities it matters less when an idea came about, and matters more whose idea it is (because it probably relates to that person's other ideas and their whole body of work).

Reflection & Discussion Question 1: Peer Review

In the chapter Types of Sources, we discuss how peer review is used both as a form of gatekeeping and as a process of getting feedback to improve a work. But scholarly peer review, coordinated by an editor, is not the only way to do peer review. Below are a variety of peer reviewer guidelines. Pick any two to read and then answer the questions below.

Rise Model of Peer Feedback

Peer Review Guidelines for Students

Elsevier (academic journal publisher) Guidelines

Publons 12 Tips For Peer Reviewers

- What guidelines seemed most important and why?
- How could you use peer review, or a similar process to improve your work? Who would you ask for a review?

- What questions would you ask someone reviewing your work? What kind of feedback would be most helpful?

Reflection & Discussion Question 2: Citation

Consider the Works Cited list below and answer the following questions.

Works Cited

1. Edward Bernays
2. Wikipedia. Public Relations
3. Pinterest. Retrieved June 10, 2021.
4. Bernays, Edward. Crystalizing Public Opinion.
5. Encyclopedia of Propaganda

- What impression does this list communicate to the audience?
- In what ways might these citations be confusing for the reader and how could they be improved?

Reflection & Discussion Question 3: Your Citation Practices

When you are sharing work in an academic setting, it makes sense to use one of the standard citation styles, because that is what academic audiences expect. But academic audiences aren't the only audiences. Think about the format of the work you are creating and the audience you intend to reach and answer the questions below.

- Will you use a standard academic citation format? If yes, which one? If not, why not?
- Take a look at your list of sources. What information about these sources will be most useful to your audience and why?
- If you are producing work in more than one format (website, poster, video, handout, etc.) how will your citation decisions differ across these formats?