

FIRST YEAR SEMINAR READINGS

**FIRST YEAR SEMINAR
READINGS**

CATHIELEBLANC



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About This Book

This book is an Open Educational Resource (OER). The material in this book was built using material from other openly licensed material as well as material created by the Fall 2017 First Year Seminar Fellows at Plymouth State University. It was designed specifically for Plymouth State University's First Year Seminar with each section representing one of the six goals of the course.

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Introduction

Through the general education program at Plymouth State University, you will develop “habits of mind” that contribute to your long-term well-being and success. As the first course in the general education program, the First Year Seminar (FYS) provides the foundation for your learning throughout the program. In the FYS, you will learn about a “wicked problem” and work on a project that will address some aspect of the problem. By engaging in this work, you will meet the goals of the course. In particular, by the end of the course, you will:

1. Understand the purpose of general education and make connections between general education and major coursework.
2. Understand and engage interdisciplinary thinking, integrative learning, and integrated clusters.
3. Understand and apply various methods of inquiry including critical thinking and design thinking.
4. Engage problem-based learning by exploring challenges/problems/questions from interdisciplinary perspectives.
5. Engage collaborative learning in open laboratory spaces.
6. Become skilled in Information Fluency, exploring the sources of evidence, evaluating different kinds of evidence, and drawing relevant conclusions from the evidence.

The faculty who teach the FYS have developed this book to support the class. The readings are organized around the six goals of the course and represent a mix of materials gathered from other sources along with materials created specifically for this course.

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PART I

General Education

In this section of the book, you will learn about what general education is and why it is important. In addition, you'll learn about the details of Plymouth State University's general education program.

Why General Education?

General education opens an appreciation of the various ways a person can consider and understand the human experience, and of the breadth of human knowledge. General education is meant to teach **habits of mind**. Specifically, the general education program at Plymouth State University focuses on the following four habits of mind: **problem solving, purposeful communication, integrated perspective, and self-regulated learning**.

These important and critical habits of mind create flexible thinking and flexible skills that will translate into real world experiences and application. As a student, you will be pushed out of your comfort zone and into new and different fields, encouraging a broader world view. Drawing from different fields, specializations, and areas of knowledge creates a comprehensive education that can be applied and utilized in meaningful and previously unexplored and “unexpected” ways.

Many people “don’t know what you don’t know until you learn it”! Therefore, general education is teaching you about problem-solving, curiosity, life-long learning with a purpose, adaptability, and strong work ethic. These habits of mind will serve you well throughout your college career as well as long after you graduate.

More specifically, a structured general education program focuses on branching out and providing different skills and ways of thinking to students that they may not have had prior to their general education experience. Using a structured general education program helps to create an interdisciplinary and integrative structure that guides methods of inquiry, again pushing students out of their comfort zones and into new ways of thinking. Furthermore, using a structured general education program creates a shared experience among students

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that encourages interaction across disciplines that may not have been fostered otherwise.

Different majors, programs, disciplines, and clusters are all represented in the general education program at PSU in order to create habits of mind and develop those new methods of inquiry. All of these different programs contribute to the educated person (re: reading) and what employers are looking for in future employees and what graduates can expect of their college education.

Finally, beyond learning new ways of thinking and habits of mind students also develop and prepare to “understand and manage complexity, diversity, and change” (LEAP Challenge, 2015). The general education program helps you to develop highly transferable skills that are marketable and flexible in a changing world. These skills and habits of mind are invaluable and you will carry them with you long after you leave PSU.

Habits of Mind

NOTE: This section is in DRAFT form until the Gen Ed Outcomes Task Force finalizes its work.

A **habit of mind** is a usual way of thinking, a way of engaging with the everyday world. The general education program at Plymouth State University is designed to encourage particular habits of mind that will be helpful to a student long after graduation. There are four habits of mind that we focus on: **purposeful communication**, **problem-solving**, **integrative perspective**, and **self-regulated learning**.

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

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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.

Why Gen Ed: The Employer's Perspective

Employers are typically looking for college graduates who have met learning outcomes that are associated with the kinds of habits of mind gained from a strong general education program. The following list came from a 2010 survey of employers conducted by the American Association of Colleges and Universities (AAC&U). You can see that most employers would like colleges to put even more emphasis on general areas such as communication, problem solving, and collaboration skills.

Percentage of Employers Who Want Colleges to “Place More Emphasis” on Essential Learning Outcomes



★ Knowledge of Human Cultures and the Physical and Natural World

• Science and technology	70%
• Global issues	67%*
• The role of the United States in the world	57%
• Cultural diversity in the United States and other countries	57%
• Civic knowledge, participation, and engagement	52%*

★ Intellectual and Practical Skills

• Written and oral communication	89%
• Critical thinking and analytic reasoning	81%
• Complex problem solving	75%
• Teamwork skills in diverse groups	71%*
• Creativity and innovation	70%
• Information literacy	68%
• Quantitative reasoning	63%

★ Personal and Social Responsibility

• Ethical decision making	75%
• Intercultural competence (teamwork in diverse groups)	71%*
• Intercultural knowledge (global issues)	67%*
• Civic knowledge, participation, and engagement	52%*

★ Integrative and Applied Learning

• Applied knowledge in real-world settings	79%
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Note: These findings are taken from *Raising the Bar: Employers' Views on College Learning in the Wake of the Economic Downturn*, a survey of employers conducted for AAC&U by Hart Research Associates and published in 2010. For a full report on this survey and related employer findings, see www.aacu.org/leap.

*Starred items are shown in multiple learning outcome categories because they apply to more than one.

LEAP 

Gen Ed at PSU

The information in this section of the book about PSU's General Education program is from Plymouth State University's 2017-18 Academic Catalog.

Plymouth State University provides opportunities for students to cultivate the mind in ways that will lead them to full awareness as adults, and to lives in which occupational achievement is balanced by social responsibility, cultural experience, and personal happiness. The University measures its excellence, not by the quality of students who enter its doors, but by the quality it adds to those who graduate. Because of this commitment, Plymouth State University believes that every student must receive a strong general education as well as specialized instruction in a field. The undergraduate General Education program gives students a broad perspective on ideas and an awareness of diverse human experiences and cultures.

The General Education program is meant to ensure that students develop the skills necessary for academic success and lifelong learning, an appreciation of the various ways scholars consider and understand human experience, and an appreciation of the process by which different approaches to scholarship can be brought to bear on the same problem. Courses taken to ensure breadth of knowledge emphasize the relevance and application of methods of inquiry and content to students' lives.

Skills

To live and learn in a multicultural, multimedia, multidimensional world, students need certain skills. These are the competencies expected of an educated person, the skills needed for lifelong learning.

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In this General Education program, the following skills are developed in meaningful contexts.

Critical Thinking: the abilities to compare, contrast, analyze, and synthesize; and to challenge underlying assumptions; to take imaginative leaps and intellectual risks; and to solve problems creatively and effectively.

Reading: the achievement of advanced literacy; that is, the ability to comprehend written material within a variety of genres, and to articulate one's response verbally and in writing.

Quantitative Reasoning: the ability to analyze quantitative materials and use quantitative techniques to solve problems.

Writing: development of a writing process that includes the ability to pre-write (brainstorm, outline, take notes, free-write) on a selected topic; to prepare, assess, and organize information; and to compose, revise, and edit a polished product.

Speaking and Listening: the ability to use both verbal and nonverbal skills to communicate effectively in one or more languages, to listen actively, and to take part respectfully in group discussions.

Conducting Research: the ability to locate, comprehend, and synthesize information; and to understand what constitutes reliable evidence for decision making.

Working with Information Technology: the ability to perform searches; to use word processing and spreadsheets; to work with database management systems and presentation software; to work with software to enhance the creative process; and to make effective use of software to organize information and to communicate with others.

Collaborating with Others: to know, understand, and respond to others' feelings and perspectives; to work and learn in teams to enhance interpersonal relationship skills; and to develop an awareness of leadership approaches and the ability to influence others.

Overview: Components of PSU's Gen Ed Program

In Plymouth State University's General Education program, you will take three First Year Experience courses which introduce the skills listed in the previous chapter. The skills are then further developed and refined in the other components of the program: the Directions courses and the Connections courses, as well as in the major. You will take two courses in each of four Directions. These courses are designed to excite you about learning and to give you breadth of knowledge and experience with different approaches to learning. Though taught by the various academic departments, they are required of no major and are open to all students. Connections courses help you develop more advanced academic skills, appreciation of difference, and appreciation of wellness within specific academic contexts. Three of the seven Connections must be explored within the context of the major; the other four may be explored in that context or in some other.

Overview of the Three Components

First Year Experience

EN 1200 Composition

IS 1111 The First Year Seminar: Critical Thinking and the Nature of Inquiry

MA Mathematics Foundations

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<i>Directions</i>	<i>Credits</i>
Creative Thought	6
Past and Present	6
Scientific Inquiry	6-8
Self and Society	6

<i>Connections</i>	<i>Credits</i>
Diversity *	3
Global Awareness *	3
Integration *	3
Wellness *	3
Quantitative Reasoning in the Disciplines **	
Technology in the Disciplines **	
Writing in the Disciplines **	

*These Connections may be double counted with a major, minor, or any other General Education requirement.

**These Connections are three or four-credit experiences taken as part of the major and hence add no credits to those required of the major.

Description of Components: First Year Experience

The goals of the First Year Experience component are to connect you to life in an academic community and to introduce and practice in a meaningful context the skills listed earlier in this section of this book. The component consists of the following three courses to be taken during the first year.

Composition 3 credits

The Composition requirement is intended to help you become a responsible writer who can take charge of your own writing process. It is satisfied by the course EN 1200 Composition or its equivalency. You will learn how to draft, respond to feedback from peers and the instructor, revise and edit successful college prose. By the end of the course, you should be able to write essays that are unified by a central thesis, well-developed in carefully organized paragraphs with vivid details, and grammatically appropriate with effective sentence structure and correct mechanics.

You will also learn to read comprehensively and effectively in order to relate ideas and arguments to your writing and thinking. You will be expected to summarize different kinds of texts, paraphrase the ideas of someone else, analyze others' arguments and positions, compare and contrast ideas, and generate your own thoughts and ideas following research and observation. You will be required to engage in library research and to write papers based on your research. Thus the General Education Skills being given special emphasis in this course are **writing, reading, conducting research, and collaborating with others.**

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First Year Seminar 3 credits

You are currently taking IS 1111 The First Year Seminar: Critical Thinking and the Nature of Inquiry. This course introduces you to the concepts of general education and the academic community and to the skills educated people use to generate and address important questions. Using critical thinking skills and basic tools of gathering and evaluating information, you, your peers, and the instructor together explore a specific question which challenges contemporary thinkers. The question varies across sections of the course.

The First Year Seminar is a cornerstone course, through which you begin to build the repertoire of intellectual skills needed for university-level work. The skills are not taught in isolation but rather in the context of the topic or problem of the course. Assignments and activities introduce all of the skills listed above, but special emphasis is given to **critical thinking, conducting research, working with information technology, writing, speaking and listening, and collaborating with others.**

Mathematics Foundations 3 credits

Through the Mathematics Foundations requirement, you will become aware of the importance of mathematics and its application to fields as diverse as art, music, and science. It is satisfied by a mathematics course numbered MA1500 or above, or by a mathematics course that is equivalent to MA 1500 or above, including credit-by-exam as explained in the Academic Catalog.

Mathematics Foundations courses focus on problem solving using the language of mathematics and on developing your ability to reason quantitatively in diverse contexts. You will learn to reduce complex problems to their fundamentals using algebra and geometry.

The Mathematics Foundations requirement enables you to make connections between mathematics and your own life and to explore the roles of mathematics in society, culture, and politics. General Education skills given special emphasis are **quantitative reasoning, critical thinking, and working with information technology.**

More information about fulfilling the Mathematics Foundations requirement can be found in the Academic Catalog.

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Description of Components: Directions

The Directions component is intended to introduce you to different ways of considering and understanding human experience which you can apply as you seek meaning in your life. Directions courses challenge you to see how different perspectives shape the ways in which people interpret ideas and experiences to construct meaning. They emphasize connections between the world of ideas and the “real world.”

Rather than introducing a whole academic discipline, these courses focus on a particular issue or problem or topic of interest within the discipline, especially a topic relevant to your own lives. Ideally and whenever possible, alternative perspectives and approaches are woven into the course. No Directions course is required as part of any major.

The four Directions essentially represent four different approaches to learning, defined by a combination of method of inquiry and content. They are intended to further strengthen the academic skills upon which the First Year Experience is based. Different Directions emphasize different of these, but among them all skills are included. Because these skills are useful in all academic work, you are encouraged to take Directions courses early. Ideally all should be completed by the end of the second year.

You must take two courses in each of the Directions categories. Directions courses will be a minimum of three credits. Some, for example, Scientific Inquiry courses involving laboratory work, may be more.

Creative Thought Directions 6 credits

People need to be creative in order to thrive in our complex and

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changing world. People need to understand the creative processes that lead to the generation of ideas and to engage in new interpretations of existing ideas. Creative Thought courses encourage you to recognize beauty in its many manifestations and to become aware of formal elements of creative expression.

These courses also encourage you to view yourself as a creative being, to appreciate creativity in others, and to regard creativity as an essential component in all areas of human endeavor. In these courses, you will develop and value perseverance and a tolerance for ambiguity. You will be challenged to appreciate aesthetic forms, to use your imagination, and to develop the skills and attitudes that allow creativity to flourish: independence and non-conformity, the ability to organize and reorganize information, and the confidence to think in new ways. Creative Thought courses emphasize the skills of **critical thinking, reading, writing, listening and speaking, and working with information technology.**

Past and Present Directions 6 credits

In order to comprehend the present and envision the future, we must understand the past. Cultures and societies discern time and construct chronologies of significant events to explain the past, comprehend the present, and envision the future. By examining issues and events that are currently impacting your life, Past and Present courses explore how people interpret causes and effects within events.

These courses encourage you to realize that different times shape different views of the world. For you to realize that all fields of knowledge are subject to change, you need to study the changes that have taken place within those fields. You also need to understand the dialectic movement between the past and present: just as the past shapes the present, so does the present shape our understanding of the past. Past and Present courses emphasize the skills of **reading, writing, speaking and listening, critical thinking, and conducting research.**

Scientific Inquiry Directions 6–8 credits

The methods of science are powerful tools with which we can attain

a clearer understanding of the world. In the modern world, science has real application to all people's lives. Scientific literacy helps people to make sense of the explosion of information they encounter every day. Scientific Inquiry courses use scientific methodologies to examine relationships between events in the natural world and make you aware that science occurs in a social, cultural, political, and ethical context.

Use of scientific methods in laboratory or field settings is an integral part of these courses. As you plan investigations, collect, analyze, and interpret data, and develop your ability to propose answers, offer explanations, and make predictions, you will come to see both the power and the limitations of science. You will investigate the distinctions between rational thinking and anecdotal argumentation and develop an understanding that answers are never final, but always subject to revision. Scientific Inquiry courses emphasize the skills of **critical thinking, writing, conducting research, quantitative reasoning, working with information technology, and collaborating with others.**

Self and Society Directions 6 credits

A rich and productive life encompasses an understanding of yourself and your relationship to the world. An educated person must grapple with a question that has interested human beings for centuries: the relationship between self and society. To understand yourself, you must understand and acknowledge the impact of society on the development of your identity and the formation of your beliefs. The needs of the individual sometimes conflict with the needs of society. Cultures differ in the relative value they give to the individual and to the group.

Using issues that impact on your life, Self and Society courses explore questions of these sorts. They encourage you to inquire into multiple dimensions of self including the social, physical, emotional, and cognitive, and to investigate the interactions between individuals and the spatial, temporal, political, economic, and technological aspects of the social environment. Self and Society courses emphasize the skills of **reading, writing, speaking and listening, critical thinking, conducting research, and collaborating with others.**

Description of Components: Connections

The Connections component is intended to tie general education to the rest of the curriculum, including the majors, by helping students develop attitudes shared by educated people and more advanced academic skills within specific academic contexts. Three of the seven Connections are tied explicitly to the majors in that students take courses required by the major which advance their writing, quantitative, and technological skills in ways appropriate to the major. In many cases, one or more of the other four Connections may be tied to the major as well.

Diversity Connection* 3 credits

Becoming educated involves developing awareness of, sensitivity to, and appreciation for viewpoints other than those to which we have been acculturated. Through such development comes increased respect for those different from oneself.

Students take a three-credit Diversity (DICO) course (either within the major or not) designed to broaden and deepen awareness and appreciation of differences and commonalities of sub-cultural groups in the U.S. society defined by differences in race, ethnicity, ability, social class, religion, politics, gender, or sexual orientation. Diversity courses do this by exposing students to the life stories and the voices of members of different groups and by exploring issues of equity, opportunity, and justice.

Global Awareness Connection* 3 credits

Educated people are aware that human beings are interdependent members of a world community, that there are both similarities and

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differences in the societies and cultures of the world, and that the manners in which people live their lives need not be exactly alike.

Students take a three-credit Global Awareness (GACO) course (either within the major or not) designed to expose them to the important societal issues facing the world and to encourage them to develop the ability to appreciate and think about issues from different points of view. Global Awareness courses focus on the forces that have shaped peoples, cultures, nations, and regions of the world. They increase students' understanding of each person's position, participation, obligations, and responsibilities within the world community.

Integration Connection* 3 credits

We live in a world where scholarship is increasingly interdisciplinary. The educated person recognizes the challenges and rewards of drawing connections between fields of knowledge and of applying alternative methods of inquiry to solve problems.

Students take a three-credit Integration (INCO) course (either within the major or not) which brings content or methods of inquiry from two or more disciplines or perspectives to bear on a problem or question. The Integration course is a General Education capstone course, taken in the junior or senior year. As such, it should require substantial, although general, background and a high level of proficiency at most or all of the General Education skills.

Wellness Connection* 3 credits

To be fully educated, people need respect for and understanding of how health, physical activity, and wellness contribute to mental acuity and emotional well-being. Awareness of and attention to the physical can enhance the cognitive and emotional aspects of life.

Students take a three-credit Wellness (WECO) course (either within the major or not) designed to increase their understanding of the connection between mind and body. These courses expose students to the theory and practice of life-span wellness and fitness activity, and to the knowledge, attitudes, habits, and skills needed to live well. Their

goal is to help students cultivate life skills which will promote mental, physical, and emotional well-being.

Quantitative Reasoning in the Disciplines** (3 credits within the major)

Mathematics finds application in all fields of scholarship. All disciplines make use of quantitative reasoning in some way and to some extent.

Students take a three-credit Quantitative Reasoning (QRCO) course specified as required for their major. This course may be taught within the major discipline or not. It might teach quantitative techniques used as primary or secondary tools within the discipline, or might be a course in which students of less quantitative disciplines come to deepen their appreciation of the relevance of quantitative reasoning to us all.

Technology in the Disciplines** (3 credits within the major)

In the modern world, technology has application to every academic discipline, and educated people must have an understanding of technology that will allow them to adapt to rapid technological change.

Students take a three-credit Technology in the Disciplines (TECO) course specified as required for the major. This course may be taught within the major discipline or not. The course will help students examine the role of technology within their own discipline and within a larger societal and cultural context. The TECO course will provide students with hands-on experience using current technologies; with a broad understanding of the concepts underlying current technology; with an understanding of the potential ethical issues involved with the use of technology; and with an understanding of forces, based in the needs and values of our culture, that drive technological innovation.

Writing in the Disciplines** (3 credits within the major)

Students take a three-credit Writing course (within a major) that contains significant writing experiences appropriate to the discipline. These experiences must include Writing Across the Curriculum activities that facilitate student learning and help students become better writers. At a minimum these activities demonstrate three specific

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aspects. (1) Students in the course do substantial writing that enhances learning and demonstrates knowledge of the subject or the discipline. Writing assignments should be an integral part of the course and account for a significant part (approximately 50 percent or more) of the final grade. (2) The course demonstrates an approach to writing as a process where students have the opportunity to submit and receive feedback on multiple drafts of major assignments. (3) Students have the opportunity to write for formal and informal, graded and ungraded occasions throughout the course with an emphasis on the use of writing as a mode of learning.

* These Connections may be double counted with a major, minor, or any other general education requirement.

** These Connections are three or four-credit experiences taken as part of the major and hence add no credits to those required for the major.

Resources

- PSU's Academic Catalog beginning on page 52:
<https://www.plymouth.edu/current-students/academic-resources/wp-content/uploads/sites/123/2016/09/AcademicCatalog17-18.pdf>
- “General Education Requirements: What’s the Point?”
<http://www.collegexpress.com/articles-and-advice/majors-and-academics/articles/collegeacademics/general-education-requirements-whats-point/>
- “Gen Eds: Not a Waste of Time” <http://www.collegexpress.com/articles-and-advice/majors-and-academics/articles/collegeacademics/general-education-courses-not-waste-time/>
- “Having a Degree and Being Educated”
<https://perspectives301.files.wordpress.com/2013/09/pellegrino-lewis.pdf>
- “The Educated Person” [http://faculty.ccp.edu/faculty/sgramlich/FOS/educated%20person\[1\].pdf](http://faculty.ccp.edu/faculty/sgramlich/FOS/educated%20person[1].pdf)

PART II

Interdisciplinary, Integrative, Integrated

In this section of the book, you will learn what a discipline is and what interdisciplinary thinking and integrative learning are. You will also learn about Plymouth State University's approach to integrated clusters and the impact they will have on your educational experience.

Interdisciplinary Thinking

A **discipline** is a field of knowledge claimed to be the special province of those who agree it is theirs for studying in particular ways. The community of people who are experts in the field of knowledge agree on the phenomena worthy of study within the discipline as well as the tools, theories, and methods through which those phenomena will be studied. And they use the tools, theories, and methods to expand the knowledge about the phenomena. For example, experts in scientific disciplines such as biology, physics, chemistry, and so on agree that knowledge about those disciplines is expanded through the use of the scientific method, a set of techniques based on the use of empirical evidence gained through formulating and testing hypotheses. Although these sciences share some tools and methods, they are considered different disciplines because they focus on different phenomena to study. Sometimes, different disciplines study the same phenomena but use different tools.

In college, you will learn about the tools, theories, and methods of a particular discipline when you declare your major. Some majors, however, represent a small piece of a larger discipline. For example, the discipline of social science has many sub-disciplines, such as anthropology and sociology (and many others!). This dividing of knowledge and the tools for adding to it has led to narrower and narrower fields of study, spurring debate about where the boundaries between them lay. Narrowly defined disciplines ensure a high level of expertise (which is a very good thing!) but also has resulted in creating what some call a “silo” effect. This is where a set of experts in a field have become so focused on the details of their disciplinary approach to

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an issue that they ignore other disciplines – even those that might be examining a different angle of the very same issue.

The boundaries that define a particular discipline are constructed socially by the experts in that discipline. Sometimes, approaching a phenomenon using multiple disciplines can illuminate the phenomenon in helpful ways. **Interdisciplinary thinking** is the ability to consider multiple disciplinary perspectives concerning the phenomenon under study, analyze the strengths and weaknesses of those perspectives, and integrate their insights to produce a new, more comprehensive understanding of the phenomenon. Ideally, interdisciplinary thinking will yield a synthesized solution, a new application, or point to new ways to better understand the phenomenon.

Because the First Year Seminar is focused on a wicked problem, interdisciplinary thinking is crucial to the class. Wicked problems are so complex that they defy easy solutions that might be suggested by individual disciplines. Instead, we will need to look at the wicked problem from as many disciplinary perspectives as we can and integrate the insights from those perspectives to better understand the problem and suggest possible solutions.

Integrative Learning

Integrative learning focuses on making connections among disciplines, knowledge, experiences, people, and so on. It is the result of good teaching that practices the principles of interdisciplinarity: blending different disciplinary expertise into a new whole.

Moti Nissani uses a metaphor to explain the idea of interdisciplinarity that will help us understand integrative learning. Imagine each discipline is a different fruit. A colorfully filled fruit bowl is “multi-disciplinary” because even after having been tossed, the pieces of fruit (or disciplines) are just sitting next to each other. In this scenario, if you took a bite of a blueberry that had rested against a pineapple, you would know it was a blueberry from its size, shape, texture, and the predominance of its distinctive flavor. However, put the fruit into a blender and you have integrated their flavors, textures, and shapes into something that is very different from any of the fruits that you added. (You can even boldly break-out of the fruit “family” and add an entirely new item like yogurt!) Your smoothie now is an integrated product. The blender is the process of integrative learning – forcing what seemed different and disparate to come together into a new whole that is quite different from the ingredients.

Integrative learning at PSU also involves making other kinds of connections:

- Between your classes, including between your major classes and your General Education classes;
- Between your in-class and out of class academic experiences;
- Between your academic and extra-curricular experiences;
- Between your academic and residential life experiences;

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- Among faculty and students in different majors and disciplines;
- Between faculty, staff, and students and people outside of the University;
- And many more.

The goal of integrative learning at PSU is to make your educational experiences more meaningful by allowing you to see them as connected to the rest of your life.

Integrated Clusters

In July 2015, Dr. Donald Bix became the president of Plymouth State University. His vision is to organize the entire University into 7 **integrated clusters**. Each of the disciplines (majors) on campus is associated with one of the clusters, forming disciplinary families. The 7 clusters are:

- Arts and Technologies
- Education, Democracy, and Social Change
- Exploration and Discovery
- Health and Human Enrichment
- Innovation and Entrepreneurship
- Justice and Security
- Tourism, Environment, and Sustainable Development

Although your major is associated with one of these clusters, you may work on projects associated with different clusters. For example, Media Studies is part of the Arts and Technologies cluster. Many students majoring in Media Studies are interested in and have skills in telling stories through video. A student may find herself working on a video project for Health and Human Enrichment telling the stories of individuals navigating social services systems. Or on a video project for Exploration and Discovery explaining complex science findings. Or on a video project for Innovation and Entrepreneurship helping an innovative business start up tell its story to potential investors. So your major doesn't preclude you from working on projects that interest you but that are part of other clusters. In fact, the projects that you might work on require interdisciplinary thinking and integrative learning, both of which are about breaking down boundaries. The boundaries of

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the clusters are permeable, allowing the free flow of people, resources, knowledge, and so on among them.

Dr. Birx wrote a blog post explaining what the 4 pillars of an integrated cluster-based education are: 1. First Year Seminar; 2. Open Labs; 3. themed General Education Direction courses; and, 4. an Integrated General Education Capstone course. He says:

Together these tools would provide a pathway for students from introduction through conclusion of a cluster-based educational environment. When combined with or built around a major field of study this approach would provide integrated breadth as well as depth.

The concept behind these four tools posits that students would enter into a First-Year Seminar experience that introduces them to cluster learning including a challenge question, an interdisciplinary project experience, an overview and exploration of learning and research methodologies and an understanding to theirs and other clusters. Since we already have First Year Seminars, which are laid out in a very similar manner, interested faculty could use it as a tool to kick off our students' cluster experiences.

Open laboratory environments with project-based learning experiences are a tool that facilitates engaged scholarship and brings together disciplines and individuals who want to create a multidimensional learning experience. This tool is not restricted to faculty, but is an opportunity for faculty, staff, alumni, retirees, and community members to work together on an integrated learning project/challenge. Requests for proposals for projects (and hopefully in the future, curricular design) go out regularly and with some version of block or adaptive scheduling hopefully coming on line in the future, there could be large periods of multiple "blocks" that could be used to explore this project-based learning approach and create opportunities for collaborative activities as well as field trips etc. Later when graduate programs expand, hopefully there will be involvement of

graduate students as well, but for now, more senior students could be involved in a mentoring and project lead capacity.

We have already created a process for general education at Plymouth that has a great deal of flexibility and could be adapted as another cluster tool. If we themed Gen Ed courses together we could create linked course combinations that would lead to a certificate granted upon completion of the sequence. It wouldn't mean that students had to take the sequence or even that courses couldn't be interchanged in the sequence, but students would have that option. Sequences that spanned a cluster such as Innovation and Entrepreneurship or Tourism, Environment and Sustainable Development could provide an integrated perspective along with a major while still meeting the existing guidelines of our General Education program. In some cases an individual class can achieve that goal, but often that is not the case. Moreover, while individual Gen Ed courses have many elements that relate to a student's major area of concentration, students often do not see the connections, context or relatedness and there is often not enough critical mass to establish that coherence in an individual course. ...

Finally, an integrative capstone course would be the last part of a student's undergraduate education occurring in either the last part of the student's junior or senior year. It would be the bookend for the First-Year Seminar and integrate the depth and breadth of learning over the last four years.

At PSU, the integrated clusters are the mechanism that we are using to encourage interdisciplinary thinking and integrative learning.

Resources

- Dr. Mati Nissani's thoughts on interdisciplinarity
- Dr. Birx's writings about integrated clusters

PART III

Thinking

In this section of the book, you'll learn about two kinds of thinking: critical thinking and design thinking. These are the two main types of thinking we'll be using in the course to work on our wicked problem.

Critical Thinking

Critical thinking focuses on understanding the world by exercising sound reasoning and creativity. Rather than simply memorizing a set of facts so that they can be recalled on demand, critical thinking involves analyzing, evaluating, interpreting, or synthesizing information and applying creative thought to form an argument, solve a problem, or reach a conclusion. Critical thinking skills are developed through learning how others make arguments, and then applying that knowledge to how we structure our own arguments.

According to a 2006 survey of human resource professionals, critical thinking is ranked as one of the most important skills employers seek in job applicants, yet one which many college graduates are lacking or in need of improvement. Unlike skills specific to a particular major (think: coding for a computer science student), critical thinking is a 21st-century skill essential to all majors and types of work, and allows college graduates the flexibility necessary in the fast-moving and unpredictable economy of the future.

Design Thinking

Design thinking focuses on solving real world problems by using the same process that designers use to make products and applying this framework to new situations. It is solution-focused and is predicated on the idea of asking good questions and taking actionable steps. The design thinking process focuses on eight core abilities:

1. Navigate ambiguity
2. Learn from others
3. Synthesize information
4. Experiment rapidly
5. Move between concrete and abstract
6. Build and craft intentionally
7. Communicate deliberately
8. Design your design work

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.”

There are 5 phases in the design thinking process. As a designer

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works, she moves in and out of these phases in no particular order, revisiting each phase as necessary. The first phase is about **empathy**. We need to know the people involved in the problem, especially the “end-users,” those most affected by the 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. The second phase 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. The third phase is about **ideation**, where the designers (in this case, the students) generate many ideas about how to satisfy the need identified in the definition stage. The fourth phase is to build several small-scale **prototypes** where particular aspects of the solution to the problem are chosen for implementation. This is an experimental phase where the goal is to identify the best solution to the needs with the constraints identified in the other phases. The fifth phase 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.

The d-school (Design School) at Stanford University has published a useful Introduction to Design Thinking Process Guide that clearly explain these 5 phases.

Wicked Problems and Thinking

Critical thinking is essential to understanding and working to solve wicked problems because it forces us to reflect on and question what we *think* we know about a particular issue. Furthermore, it gives us the skills to develop sound arguments as we try to advocate for a solution. Design thinking can be particularly useful in solving wicked problems because of the ambiguous nature of wicked problems. Part of the design thinking process involves gathering data to clearly define the problem, which is an important aspect of addressing wicked problems because the definition of the problem is not always clear at the outset.

Resources

Recommended resources:

- Critical Thinking definition (Foundation for Critical Thinking)
- 5 Tips to Improve your Critical Thinking (TedED)
- How cognitive biases that affect your thinking (Mentalfloss infographic)
- The Backfire Affect (The Oatmeal online comic)
- Introduction to Design Thinking Process Guide (Stanford d-school)
- What is Design Thinking?
- The Process of Design Thinking (The Interaction Design Foundation)
- Designers – Think Big! (Ted Talk by Tim Brown, founder of IDEO)

PART IV

Focus on Problems

In this section of the book, you'll learn what wicked problems are and why we are focused on them in the First Year Seminar. You'll also learn about the value of an education that focuses on working on problems.

Wicked Problems

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.
5. Explanations for wicked problems vary because no single observer can claim to have properly analyzed and understood the true nature of the problem.
6. Wicked problems are the results of other wicked problems. Addressing one problem may result in the amelioration of others. For example, improving education

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will have positive implications on health, nutrition and family planning.

7. There is no definitive scientific test for the solution of a wicked problem because they are human caused and not natural phenomena.

8. 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.

10. Designers attempting to address a wicked problem must be fully responsible for their action

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

Problem-Based Learning

Problem Based learning (PBL) is a student centered approach to explore content and concepts through the challenge of a specific problem. The terms Problem Based Learning and Project Based Learning are often used interchangeably, but there are distinctions. Problem Based learning can be considered a sub-set of Project Based Learning approaches.

There are many variations of the steps of effective PBL. Here is an example from John Larmer of the Buck Institute for Education. Problem-based learning typically follows prescribed steps:

1. Presentation of an “ill-structured” (open-ended, “messy”) problem
2. Problem definition or formulation (the problem statement)
3. Generation of a “knowledge inventory” (a list of “what we know about the problem” and “what we need to know”)
4. Generation of possible solutions
5. Formulation of learning issues for self-directed and coached learning
6. Sharing of findings and solutions

According to Cornell University’s Center for Teaching Excellence, a PBL approach fosters skills and aptitudes that can support student success in the school and post-graduation. Citing Linda Nilson’s 2010 book; *Teaching at its Best*, PBL project provides students with the opportunity to develop skills and experience with:

- Working in teams and working independently
- Managing projects and holding leadership roles

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- Oral and written communication
- Self-awareness and evaluation of group processes
- Critical thinking and analysis
- Explaining concepts
- Self-directed learning
- Applying course content to real world examples
- Researching and information literacy
- Problem solving across disciplines

Through well designed PBL, learners are challenged to think in systems and connectivity, and engage in higher order thinking skills such as perspective taking, decision making, and goal setting. By exploring specific problems, students begin to recognize that problem solving is a complicated process and requires abundant background knowledge and deep consideration of context. Nothing exists in isolation and each problem requires us to think deeply and flexibly about possible solutions. Every possible solution has impacts. Learners have to be informed and perceptive to see implications of each solution and evaluate the soundness of proposed solutions. This changes the motivation for being informed. Problem based learning has been shown to increase student engagement and improve retention of key concepts as it help bridge the gap from theory to practice (Ahlfeldt et al.).

Resources

- Wicked Problems in Design Thinking, Buchanan: http://web.mit.edu/jrankin/www/engin_as_lib_art/Design_thinking.pdf
- Solving Problems that Matter, Boik: <https://medium.com/age-of-awareness/solving-problems-that-matter-could-be-the-next-big-thing-8a068dfa4ce2>
- Wicked Problems Worth Solving, Stanford Social Innovation Review https://ssir.org/articles/entry/wicked_problems_problems_worth_solving
- The Lean Mindset Wicked Problems, Poppendieck <http://www.leanessays.com/2002/01/wicked-problems.html>
- Making toast activity <https://www.drawtoast.com/>
- Solving Wicked Problems through Collaboration, Denning. <http://denninginstitute.com/pjd/PUBS/ENC/collaboration09.pdf>
- Tackling Wicked Problems: A Public Policy Perspective, Australian Gov. http://www.apsc.gov.au/__data/assets/pdf_file/0005/6386/wickedproblems.pdf
- Inquiry-Based Learning–C3 Framework: College, Career, and Civic Life for Social Studies Standards. This is designed for Social Studies Educators, but the inquiry framework is applicable to all of our courses and may be helpful. <https://www.socialstudies.org/sites/default/files/c3/C3-Framework-for-Social-Studies.pdf>
- PSU ebook at Lamson: Duch, et al., 2001, The Power of Problem-based learning: A practical 'how to' for teaching undergraduate courses in any discipline. <https://plymouth.on.worldcat.org/oclc/56729499>
- Project-Based Learning vs. Problem-Based Learning vs. X-

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BL <https://www.edutopia.org/blog/pbl-vs-pbl-vs-xbl-john-larner>

- Problem-Based Learning http://www.aect.org/edtech/edition3/er5849x_c038.fm.pdf

PART V

Open Labs and Collaborative Learning

In this section of the book, you will learn about open lab spaces on campus. You will also learn about collaboration and its important role in learning.

Open Labs

An open lab is a physical or virtual space that supports Integrated Clusters by enabling engagement and collaborations between PSU faculty, staff, students and external partners and stakeholders in order to identify, discuss, and address real-world issues and problems. Open Labs do not belong to a specific Cluster, nor do they necessitate a physical space on campus. Several collaborative spaces have been developed across campus.

For example, Room 031 in Lamson Library and Learning Commons is a physical space that includes a variety of technologies and tools that can be used by any member of the PSU community as well PSU's external partners. The technologies are arranged so that users of the space can work individually or in groups.

Open labs are being used extensively for trans-disciplinary collaboration in business, government, and educational settings. Open labs facilitate the collaboration which is necessary to find solutions to wicked problems. As you are working on the projects in your classes, you should consider using the available open lab spaces and the tools they contain to support your work.

Collaborative Learning

Collaborative learning is learning that involves groups of students working together to solve a problem, complete a task, or create a product. Educators have long known that learning is a social process. Even when you think you're learning on your own, like when you're reading this book, you are engaged in a relationship with the person who wrote these sentences. Because we know the benefits of learning in groups, we have developed collaborative learning activities to encourage the development of the skills needed to engage in group work.

There are several principles underlying the use of collaborative learning activities in a classroom, particularly in the First Year Seminar. As Cornell's Center for Teaching Excellence web site explains,

- The learner or student is the primary focus of instruction.
- Interaction and “doing” are of primary importance.
- Working in groups is an important mode of learning.
- Structured approaches to developing solutions to real-world problems should be incorporated into learning.

These principles are the reasons that the First Year Seminar is focused on a wicked problem that you will work on with a group of your peers. In addition, the wicked problem that your section of First Year Seminar is focused on can't be solved by individuals working on their own. In order to even begin to understand a wicked problem, we

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have to approach it from multiple perspectives. This requires us to talk to and collaborate with other people about their understanding of the problem. So not only will you work with a group of your peers on your wicked problem, you will actively seek out the perspectives of people outside of your class regarding the wicked problem.

The collaboration skills that you will develop by working with a group in First Year Seminar are also highly valued by employers.

Resources

- *Student-Centered Learning: Creating Agency and Engagement*
<https://www.edutopia.org/article/student-centered-learning-building-agency-and-engagement>
- *Co-operative Learning: The Social and Intellectual Outcomes of Learning in Groups*, Gillies & Ashman. <http://bit.ly/2vXhKBQ> This book has a range of chapters that discuss the benefits of cooperative learning

PART VI

Information Literacy

In this section of the book, you will learn about finding information, how information is produced, evaluating the validity and reliability of information, and using information ethically in your work.

What is Information Literacy?

According to Association of Colleges and Research Libraries, “**Information literacy** is the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning.”

Information literacy is a skill that improves with practice. Throughout your life, you will find yourself in situations where you need information—information about the reliability of a car you’re thinking about buying, information about a company you’re thinking of working for, information about the positions of a presidential candidate you’re thinking about voting for. Your information needs will be many and varied. You will ask yourself where you might find the information that will be most useful to you, to help you make the best decisions possible. As you discover new information from new sources, you will ask yourself questions about the validity and reliability of that information and about how and why the information was produced. As you create your own new information that you share with others, you will need to properly and ethically summarize the ideas you found and cite those ideas so that you are not presenting them as your own. And over time, with practice, you will get better and better at these tasks.

Four Moves and a Habit

We live in the information age. Information is everywhere. In fact, information overload is cited as a problem in which we are bombarded with so much information that we sometimes feel paralyzed and can't make decisions. The person who is information literate, however, combats information overload by understanding what their information needs are, where to get useful information, and how to evaluate the reliability and validity of that information.

There are many sources for getting information. There are blogs, books, documentaries, scholarly articles, magazines, TV shows, social media platforms, and so on. Much of the information we encounter comes to us through online sources. Mike Caulfield, in *Web Literacy for Student Fact Checkers*, identifies four moves and a habit that we should use when we encounter information on the web.

What people need most when confronted with a claim which may not be 100% true is *things they can do to get closer to the truth*. They need something Caulfield decided to call “moves.”

Moves accomplish intermediate goals in the fact-checking process. They are associated with specific tactics. Here are the moves:

- **Check for previous work:** Look around to see if someone else has already fact-checked the claim or provided a synthesis of research.
- **Go upstream to the source:** Go “upstream” to the source of the claim. Most web content is not original. Get to the original source to understand the trustworthiness of the information.
- **Read laterally:** Read laterally. Once you get to the source of

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a claim, read what other people say about the source (publication, author, etc.). The truth is in the network.

- **Circle back:** If you get lost, or hit dead ends, or find yourself going down an increasingly confusing rabbit hole, 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.

In general, you can try these moves in sequence, and at each stage if you find success your work might be done.

When you first see a claim you want to check, your first move might be to look to see if sites like Politifact, or Snopes, or even Wikipedia have researched the claim. (Check for previous work).

If you can't find previous work on the claim, the real work begins. It starts by trying to trace the claim to the source. If the claim is about research, can you find the journal it appeared in? If the claim is about an event, can you find the news publication in which it was originally reported? (Go upstream).

Maybe you get lucky, and the source is something known to be reputable — some recognizable source such as the journal *Science*, or the newspaper *The New York Times*. Again, if so, you can stop there. If not, you're going to need to *read laterally*, finding out more about this source you've ended up at. Is it trustworthy? (Read laterally).

And if at any point you fail — if the source you find is not trustworthy, complex questions emerge, or the claim turns out to have multiple sub-claims — then you circle back, and start a new process. Rewrite the claim. Try a new search of fact-checking sites, or find an alternate source. (Circle back).

In addition to the strategies, Caulfield introduces one more word of advice: **Check your emotions**.

This isn't quite a strategy (like "go upstream") or a tactic (like using date filters to find the origin of a fact). For lack of a better word, he calls this a "habit."

The habit is simple. When you feel strong emotion — happiness, anger, pride, vindication — and that emotion pushes you to share a "fact" with others, STOP. Above all, it's these things that you must

fact-check. This comic from *The Oatmeal* explains why we feel strong emotions when we encounter certain kinds of information.

Why? Because you're already likely to check things you know are important to get right, and you're predisposed to analyze things that put you an intellectual frame of mind. But things that make you angry or overjoyed, well... our record as humans are not good with these things.

Our normal inclination is to ignore verification needs when we strongly react to content, and researchers have found that content that causes strong emotions (both positive and negative) spreads the fastest through our social networks. Savvy activists and advocates utilize this flaw of ours, getting past our filters by posting material that goes straight to our heart.

Building new habits requires that we identify "pegs" on which to hang those habits. So use your emotions as a reminder — as a trigger for your fact-checking habit. If every time content you want to share makes you feel rage, or laughter, or ridicule, or, sorry to say, a heartwarming buzz — spend 30 seconds fact-checking you'll do pretty well.

The 5 Ws

The librarians at the University of Tennessee developed a set of questions that they call “The 5 Ws” that can be used to evaluate the credibility of any source of information (book, article, blog post, etc.). Students at the University are given a New York Times column and are asked to answer the questions. For a copy of this resource as it was originally given to students, go to: <https://drive.google.com/file/d/0B0vtrPDaeiV6VFJUYUNzRGlf00/view?usp=sharing>. Results of the use of this activity were shared in an article published in the journal *Reference & User Services Quarterly* 53, no. 4 (Summer 2014): 334–347.

WHAT: What type of document is it?

1. In general, what is the document?

- A factual piece
- An opinion piece
- Other (please specify)

2. In particular, what is the document? (If you don't know the definition of anything below, please ask!)

- Article (Popular, published in a magazine or newspaper)
- Article (Peer-reviewed, published in a scholarly journal)
- Blog Post
- Book
- Column
- Conference Proceedings
- Editorial

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- Letter to the Editor
- Press Release
- Report
- Review (e.g., a book review or film review)
- Website
- Other (please specify)

WHO: Who created the document?

3. Who wrote this? (If there is more than one author, list only the first two authors.) Where do they work?

4. Find information about the author(s). Use Google, Wikipedia, and the author's employer's website.

- Where does the author work?
- What has the author published before?

5. Does the author have a master's degree, Ph.D., or other qualifications (such as work experience) that contribute to his/her authority?

- Yes, the author has qualifications that make her/him an authority.
- No, the author's credentials do not make her/him an authority.
- I am uncertain about the author's qualifications.

6. LIST the URLs of the websites you visited to investigate the author. Also, GIVE EXAMPLES of what you found on each site that helped you determine the author's credentials, or that left you uncertain about his/her authority.

WHY: Why was the document published?

7. Why do you think the author wrote this document? (What was his/her MAIN PURPOSE for writing?)

- To convince readers of something
- To entertain readers
- To inform readers
- To sell something to readers
- To criticize another author's work

- There is another purpose (please specify)
8. Give examples (quotes) from the text that helped you determine the author's purpose.
9. What type of language does the author use?
- Formal: The author uses technical language or discipline-specific jargon
 - Conversational: The author uses colloquial, everyday language or a narrative style
10. What is the author's point of view?
- Objective, neutral perspective
 - Interested, opinionated, favoring one side

WHEN: When was the document published?

11. When was the document published?

12. The document discusses something that happened — maybe events or the findings of a new research study. When did the events or research occur? (If the document reports on multiple events, list just a few of the most important.)

13. What was happening in the world at the time this was published that might explain why the author wrote what they did, when they did?

WHERE: Where did this information come from?

14. What is the name of the organization that published this document? (Name the newspaper, magazine, journal, website, etc.)

15. What type of publication is it? (This question does not refer to the document, but to where the document was published.) The document was published in a...

- Blog
- Academic/Scholarly Journal
- Magazine
- Newspaper
- Website
- Other (please specify)

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16. Has the publication/publishing organization won any significant awards or other distinctions?

- YES. List awards or distinctions here:
- NO. List sites/URLs you visited to check for awards:

17. Where can you contact the author and/or publishing organization if you have questions or want more information? (Check all that apply.)

- The author has an email and/or mailing address listed.
- The publishing organization has an email and/or mailing address listed.
- No contact information for either the author or the publisher is provided.

18. This publication (newspaper, journal, website, etc.) is primarily intended for what kind of audience/reader?

- Scholars and peers in a particular academic discipline (i.e., a psychologist writing about an experiment to inform other psychologists about the results)
- An educated audience interested in a particular professional trade (i.e., a marketing professional addressing others in the marketing field about a new software program)
- The general public

19. If your publication is available online, what is the domain of the publication's Website?

- .com OR .org OR .net
- .edu OR .gov
- N/A (Not Applicable: The publication does not have a website.)

HOW: How was the information gathered and presented?

20. How did the author use his/her information?

- References are cited throughout the document in a scholarly

style. (There are footnotes, endnotes, or in-text citations and a bibliography.)

- References are cited throughout the document in a popular style. (There are in-text quotes and attributions, but there is no bibliography at the end of the document.)
- References are not listed.

21. How did the author reach his/her conclusions? (Check all that apply.)

- Interviewed a group of people who are very different from one another
- Interviewed a group of people who are very similar to one another
- Gathered data from an academic research study he/she conducted
- Gathered data from a variety of news sources
- Found multiple academic research studies that support his/her study
- Other (please specify)

22. Which of the following elements does the document contain?

- Abstract (Look up the definition of “abstract” first and provide it here.)
- Advertisements
- Eye-catching fonts
- Graphics (designs, cartoons, and illustrations not conveying data)
- Graphs, charts, tables, and/or maps
- Methods section (Look up the definition of “methodology” first and provide it here.)
- Bibliography (list of references) at the end

Overall, what is your impression of the document?

23. Is the document scholarly or popular?

- Scholarly
- Popular

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24. Explain why you think it is either scholarly or popular.

For the final three questions, review the 5 Ws of your source:

WHAT	What is the document? Is it fact or opinion?
WHO	Who wrote the document? What do you know about the author?
WHY	Why did the author write this?
WHEN	When was the document published? What was happening in the world?
WHERE	Where was the document published? What do you know about the quality of the publishing organization?
HOW	How did the author gather data? How did the author present information?

25. Considering the 5 Ws, what are the document's strengths? Explain.

26. Considering the 5 Ws, what are the document's weaknesses? Explain.

27. Thinking about the 5 Ws of your source, would you cite this source in a research paper? Why or why not? Might your answer depend on the type of paper you're writing? How so?

Ethical Use of Information

The following chapter is adapted from *The Information Literacy User's Guide: An Open, Online Textbook*.

Now that you have gone through the processes involved to find and evaluate information, the next step is to start working with it. You will need to organize the information you've found professionally and ethically.

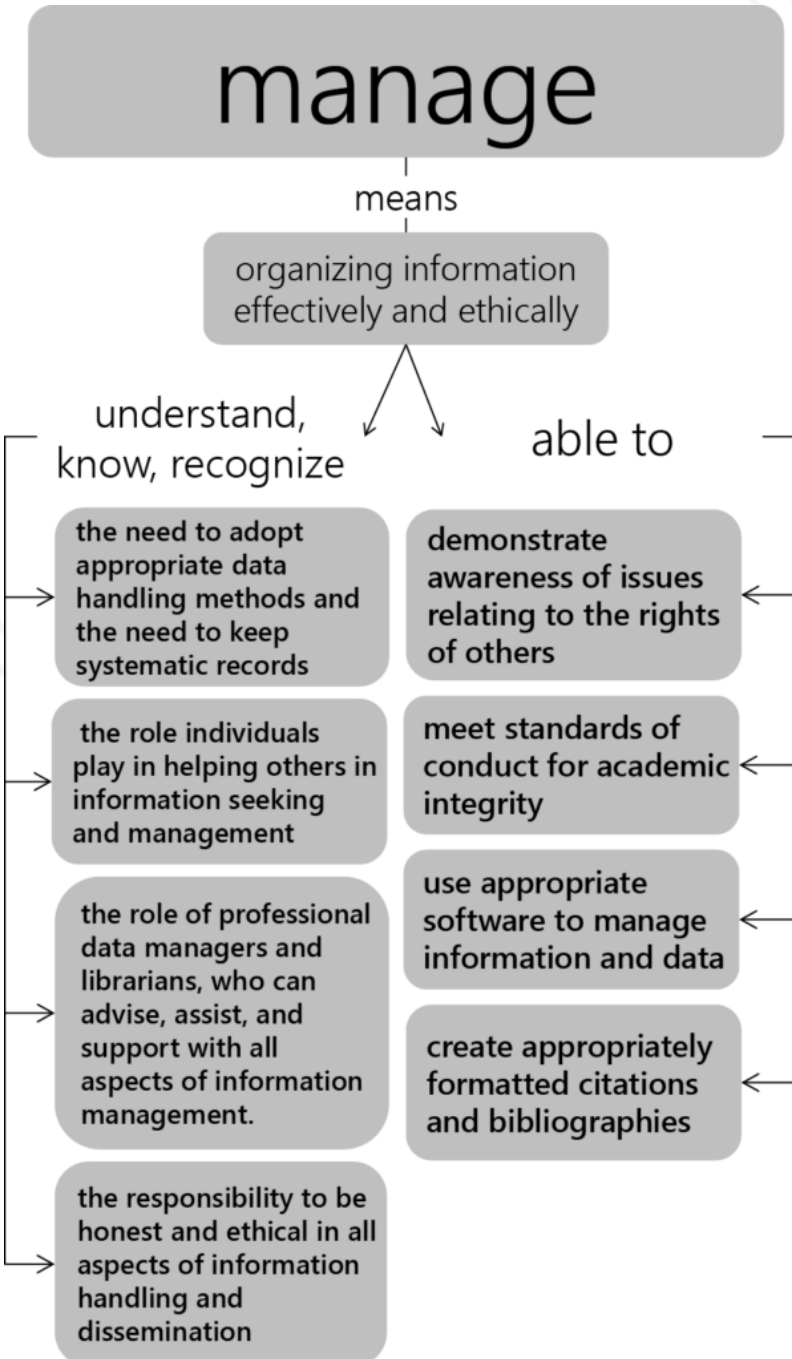
Individuals understand:

- Their responsibility to be honest in all aspects of information handling and dissemination (e.g. copyright, plagiarism, and intellectual property issues)
- The need to adopt appropriate data-handling methods
- The role they play in helping others in information seeking and management
- The need to keep systematic records
- The importance of storing and sharing information and data ethically
- The role of professionals, such as data managers and librarians, who can advise, assist, and support with all aspects of information management.

They are able to

- Use reference management software if appropriate to manage information
- Cite printed and electronic sources using suitable referencing styles
- Create appropriately formatted bibliographies
- Demonstrate awareness of issues relating to the rights of others including ethics, data protection, copyright, plagiarism, and any other intellectual property issues
- Meet standards of conduct for academic integrity
- Use appropriate data management software and techniques to manage data

It is wonderful to have access to information. It empowers us humans, with data and knowledge that leads us throughout our busy days and helps us organize our leisure time more efficiently. GPS devices and mobile phones help us get to unfamiliar destinations. We can find places to eat, to stay, and to get entertainment. All of this information is at our fingertips due to modern technology. We all take advantage



Proficiencies for managing information

of this technology to some degree and use this information to our advantage.

But there is another type of information—not just the kind that provides directions. We seek such information when we are ill and need to look up medical advice. We also seek information when in school—very few subjects require only the use of a textbook. We need to search for information and then use it in our intellectual work, because every paper or project produced in college is a product of someone's creativity.

So how should we handle this product of creativity (a.k.a. information)? Let's think about a simple example: apple picking in the fall. It is a popular thing to do, especially here in the Northeast where most of the authors of this textbook live. People come to the farm, get bags or baskets, gather apples, and then line up to weigh them and pay. The farmers' hard work is being rewarded.

Now imagine a different situation. You worked hard and wrote a very good paper and your roommate just copied a couple of paragraphs and inserted them into her own paper because the topics were related. Was this fair? How were you rewarded for your hard work? Nobody is saying that your roommate should have paid you, as you would pay the farmer for apples. But she should not use your intellectual capital without attribution to you! What she did was an act of plagiarism—you will read more about it soon!

You might publish an article in your college newsletter. This article is your intellectual personal property and you hold the copyright, which means that no one has the right to reproduce all or any part of it (i.e. copy it) without your permission. If your roommate decides to use some information from your article in her paper, she should provide a citation (the information that will help the reader identify and find your article should they decide to do so). If she is using direct quotes from your article, again, she would need to put double quotes around your words and provide information about the author (you, in this instance) to avoid plagiarism. Keep reading to find useful information about avoiding plagiarism.

Copyright and plagiarism are just two aspects of intellectual property that you need to deal with. You have to respect copyright, i.e. the rights of the author and avoid plagiarism. However, there are more aspects to it. Have you heard of patents? If you are planning a career in science and technology-related fields then you also have to learn more about patents. Patents deal with creators' rights to their invention of new machinery or processes. Plants and design can also be patented. You can find useful information at the United States Patent and Trademarks Office (USPTO). Trademarks and trade secrets are other aspects of intellectual property that you may have to deal with.

In addition to being aware of plagiarism, patents, trademarks, and trade secrets, you need to be mindful of open access issues, which relate to valuable research data and academic publications posted online for everybody to read. However, you cannot always just use the data from open access sources. You often need to ask the author for permission. Many open access publications use Creative Commons licensing. You can read more about open access in the Science Literacy chapter.

There is a lot to learn about using information legally and ethically, but this knowledge will empower you in your academic work and ultimately allow you to succeed. The following examples and tips will get you off to a good start.

Unintentional Plagiarism

Have you ever thought about why teachers and professors seem to spend way too much time urging everyone to be sure to cite all of their sources properly? You've heard it all before: footnote this, endnote that, put this in the bibliography, capitalize this word, where are the italics, the commas, periods, hanging indents, yada yada yada! It's enough to make you give up and just wing it. But hold on a second while you gather your thoughts. Why do your professors always spend so much time urging you to do something that seems to have little practical purpose?

Scenario

Jackie was working on her 10-page research paper at the last minute. It was 3:30 am and her paper was due in class at 9:00 am. She finished the

last sentence at 5:15 am, did a spellcheck and voila! Done! Groggy yet awake she went to class, turned in the paper and waited for her grade. She received an email from her professor that read, “There are some major issues with your research paper that I need to discuss with you. Please see me.” Uh oh. What could it be?

When she nervously went to see him, Professor Muntz told Jackie that she hadn’t cited any of her sources, and because she included a lot of direct quotes in her paper, she was guilty of plagiarism. She received an F on her paper and may be referred to the school administration for academic dishonesty.

Was she really guilty of something that bad? In fact, yes she was. In this chapter we will discuss the importance of managing your information sources and some tips on how to easily and effectively avoid Jackie’s pitfall.

Real World Cases

Students often feel that they are being singled out in regard to plagiarism and academic dishonesty. But that is far from the case. There are numerous examples of scholars and other professionals who have been caught plagiarizing. One such person is Doris Kearns Goodwin, a famous historian who wrote the noted *Team of Rivals: the Political Genius of Abraham Lincoln* (2006). She included material in an earlier book, *The Fitzgeralds and the Kennedys* (1987), from three other sources without citing it, according to an article written by Michael Nelson.¹

Although she has since published other works, her reputation has been tarnished, and people may not take her work as seriously because of this. Unfortunately, as Nelson points out in his article, she is not the only well-known historian caught plagiarizing.

Another example, with a dramatic outcome, is that of Eugene Tobin. He was the president of Hamilton College in New York State, when it was discovered that he had included plagiarized material in speeches he had given over the course of almost a decade. He resigned from his position as the head of this prestigious institution, admitting his guilt.³ Other college presidents and administrators have also been

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2. [1]

caught violating academic trust: if you try a search using the terms *plagiarism* and *college president*, you may be dismayed at the number of results.

Like some of the historians Nelson cites in his article, many students fall into a trap when they do research because they fail to mention where they found all of their information. Thousands of students in schools, colleges, and universities are guilty of committing plagiarism, but often they don't know they are plagiarizing.

Let's look at plagiarism and how to avoid it, and then continue on to some other intellectual property issues you may need to deal with.

What is Plagiarism?

In short, plagiarism is when you use words, thoughts, or ideas that belong to someone else without giving them credit. In the classroom (and in the world of publishing), documenting your information sources is the only way others can tell how thorough and careful you've been in researching your topic. If you don't tell readers where your information came from, they may think (and many do) that you either made up the information or "stole" it. Failing to cite your sources is plagiarism.

By managing the sources in your papers, you encourage others to do the same and you can be a go-to expert for your friends and classmates when they need help with how to find out how to cite sources properly. The information and advice you impart may help them avoid serious difficulties. Some students truly don't know that they are doing something wrong when they paraphrase information without citing the information source. They might feel that paraphrasing the words of someone who is clearly an expert on the topic is the best way to write an accurate paper. And because they aren't quoting it directly, it doesn't need quote marks or attribution, does it? While the penalties they receive might (and this is a big "might") be less severe than someone who buys a paper online or copies and pastes big sections of material into their work, the penalties could

3. ⁴

4. [2]

still be substantial. Raising your friends' awareness so they won't face this situation would be a kind thing to do.

Keeping Track of Your Sources

Try this the next time you do research. If you find some great articles on your topic, collect the following information about each as soon as you realize they will be helpful resources:

- Author name(s)
- Title of the article
- Name of the journal
- The volume number
- The issue number
- The date of the issue
- The name of the database where you found the article

Or, if you found a book, note the following once you think it might contain useful information:

- Author name(s)
- Title of book
- Place of publication
- Publisher's name
- Year of publication

Or, if you found a website you want to use, collect the following details before you leave the site:

- Author name(s)
- Title of article or webpage
- Title of overall website
- The date of the webpage (if any)
- The URL (or web address)

You might be able to get some of this information with a simple screenshot, but be sure to fill in any missing elements.

This information is often referred to as bibliographic information or metadata. It consists of essential information that identifies the information resource used to inform a research project.

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You may not use every single item that you found when you gathered your sources, but having a list of all of the sources you considered will help you keep track of everything you use for your paper.

As you read each source, write down any of the authors' ideas, quotes, or thoughts you want to use and be sure to write down page numbers, if the source provides them. When you put your paper together, you will then have all the information you need to properly cite any quote, idea, or thought that came from each source.

Reference Management Software

Many researchers take the time to gather all of this information before they start writing. However, when they are ready to compile their footnotes or bibliography they can't find their preliminary notes. It may be the case that some notes are in one notebook, other notes are in a file in their computer and still others are missing entirely. Fortunately, software has been developed that helps researchers manage their source material. You may have heard of some of these reference management products. Endnote, Refworks, Mendeley, and Zotero, among others, all help manage the information gathering and retrieval process.

In addition to providing one central location for all of your references, these reference managers can

- import bibliographic information directly from a library catalog database,
- provide additional space for personal notations,
- create a bibliography or list of references in a variety of citation styles such as APA, MLA, Chicago, and more.

Some academic libraries provide access to Endnote or Refworks. If your library does not, Zotero is available free for use with the Firefox browser and Mendeley is also available at no charge.

When to Cite

Now that you have gathered all of your information resources, you need to be mindful about how you used them in your research project. There are some very firm rules about what constitutes plagiarism:

- If you copy a sentence or paragraph verbatim (exactly) from a book, article, website, blog posting, or anywhere online or in print, you must provide information on the author and the publication in which the sentence or paragraph appears. This is known as “citing a source.”
- If you use some of the exact phrases in a sentence or paragraph, even if you are not copying the whole sentence or paragraph, you must cite your source.
- If you use original information that you have obtained from an interview or conversation with someone, you must cite your source.
- If you do not use the exact sentence or phrase but paraphrase it, or use the ideas inherent in the exact sentence or phrase, you must cite your source.
- If you reprint images, maps, diagrams, charts, or tables, you must cite your source.
- If you embed video files or audio files into your work, you must cite your source.

Exercise: Plagiarism Quiz

The following paragraph is from an article titled, “Hydraulic Fracturing Overview: Growth of the Process and Safe Drinking Water Concerns” in the March 1, 2012 issue of *Congressional Digest*.

The use of hydraulic fracturing continues to increase significantly, as more easily accessible oil and gas reservoirs have declined and companies move to develop unconventional oil and gas formations. Hydraulic fracturing is used for oil and/or gas production in all 33 U.S. states where oil and natural gas production takes place. According to industry estimates, hydraulic fracturing has been applied to more than 1 million wells nationwide. (p. 71)

Which of the following sentences does not plagiarize?

1. a. As of March 2012, hydraulic fracturing has been applied to more than 1 million wells nationwide.
2. b. Hydraulic fracturing has become more prevalent nationwide. More than one million wells have been created.
3. c. According to the *Congressional Digest*, more than one million wells in the United States use hydraulic fracturing (*Congressional Digest*, 71).
4. d. None of the sentences contain plagiarism.

Citation Styles

Citing sources and avoiding plagiarism should always be an author's intent, but it is easy to get confused about how to cite. Citation styles were introduced in the Gather chapter, but it is worth repeating that there are many different citation styles. The three styles that are used most often are APA (American Psychology Association), MLA (Modern Language Association), and Chicago. There are no hard and fast rules about when to use each style. Professors often have a preference for one style over another, so make sure that you check with your instructor about which style they prefer.

Creating properly formatted citations has become easier in recent years with the introduction of reference management software and citation generators. A citation generator is software that will help to correctly format your citations. Some popular citation generators are Noodlebib and Easybib, both are available for a fee. There are also free citation generators available online. You can search the web to retrieve them. These generators are handy to use but they often contain errors so it is important to check the results for accuracy. The following resources are useful tools for all writers.

- *Publication Manual of the American Psychological Association*, 6th edition for APA citations
- *MLA Handbook*
- *The Chicago Manual of Style*

- *Citation Fox*

You should be able to locate the three manuals in the reference section of your library. *Citation Fox* is available online.

Where to Go For Help

Even if you are a very organized person and have diligently collected bibliographic information on all of the information resources that you consulted during the research process, you may misplace essential information on a resource. You may think that since you can't find this information, you will be unable to use it. But there is another option—consult a librarian. Librarians have comprehensive knowledge about how information is organized and retrieved. They also have a wealth of information resources at their fingertips. Even if you can't retrace your steps to find the missing data, it is likely that a librarian will be able to help you find the bibliographic information you need. Librarians can also help you determine when and how to cite your work. They may even be able to help you navigate citation generators and reference managers. Librarians at your library are available to help you in person, by telephone, and via email and chat. Consult your library's website for contact information.

Ethical Issues and Intellectual Property

The Manage pillar includes the practice of professional and ethical use of information. Ethical treatment of information assumes that you are treating an author's rights appropriately and avoiding an act of academic dishonesty such as plagiarism. As a creator of information yourself, you should understand the importance of respecting other authors' rights and following the general rules set forth in legal documents (see the Useful Links about Intellectual Property section for citations to some of these documents).

There are many examples of intellectual property issues that you can find in the media. For example, in June 2013 as the authors were working on this textbook, the Supreme Court of the United States overturned the law that had previously allowed gene patenting. It might sound strange, but up until now if you were a scientist who

studied the human genome and happened to discover a new gene, under the earlier law, you could patent it, thus assuring that whenever a person needed to have a medical test involving the gene they would have to pay you as a patent holder. These types of tests usually weren't covered by insurance companies and were very expensive.

As an information creator, you want to be respectfully treated by others. That is why you should constantly strive to improve your ability to practice fair treatment of other authors' works, including being cognizant of copyright, patents, and other issues associated with intellectual property.

Academic Integrity

You have already learned about plagiarism, often enemy number one when it comes to academic success involving research and writing. But there are other issues under the larger umbrella of academic dishonesty. First of all, every academic institution has a set of academic regulations that explain what is expected of students. Students are required to make themselves familiar with these rules.

Other examples of dishonesty that are mentioned in academic regulations are multiple submissions (one may not submit one project for two different classes), cheating on examinations, and forgery. Professors are dismayed when they have to talk to the students about these issues because, inherently, every teacher wants to believe that his or her students are honest. Unfortunately, plagiarism is so common that educators have begun using plagiarism detection software, such as Turnitin (see the Useful Links section). You obviously don't want to be identified as committing plagiarism by this software.

It is imperative to understand that everybody has to be accountable for their own work and respectful of the work of others. Future scholarship depends on the accuracy and integrity of prior scholarship. That is why, when doing research one must use the information produced by other people responsibly, i.e. provide citations within the text and a list of references at the end of the paper with full citation information that will allow retrieval of the document. Remember what you have learned in this chapter about managing your sources and citation style. If you are diligent about applying this knowledge and

careful about giving credit where credit is due, you should have no worries.

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1. Nelson, Michael. "The good, the bad, and the phony: Six famous historians and their critics," *The Virginia Quarterly Review*, 78, no. 3 (2002): 377–394. ↵
 2. Isserman, Maurice. "Plagiarism: A lie of the mind," *The Chronicle of Higher Education*, 49, no. 34 (2003): B12. ↵

Resources

- Mike Caulfield's book, *Web Literacy for Student Fact Checkers*: <https://webliteracy.pressbooks.com/>
- The Information Literacy User's Guide: An Open, Online Textbook: <http://www.oercommons.org/courses/the-information-literacy-user-s-guide-an-open-online-textbook-2/view>
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