



The Research Paper
ToolBox

Instructor's Guide



Topic
p. 2 - 11



Style
p. 35 - 44



Research
p. 12 - 21



Layout
p. 45 - 59



Data
p. 21 - 29



Modality
p. 60 - 65



References
p. 30 - 34



Professionalization
p. 66 - 70



Start-to-finish guide

The basic steps of creating a research paper:

1. Find a [topic](#)
2. Do [research](#)
3. Develop a thesis
4. Analyze [data](#)
5. Write your paper, adhering to the appropriate [style](#) guide, in the [layout](#) of your choosing
6. Compose your [references](#) page



At this point, provided that you've sufficiently revised your paper, it will be ready to turn in. To that end, it is very important to allow adequate time to edit your paper, and if possible, have others read it and provide you with feedback.

Once your paper is complete, there are a couple of things you may wish to do with it:

- [Submit it to journals and conferences](#)
- [Convert it to other formats](#)



Finding a research topic

Finding a scholarly topic on which to review the existing literature, formulate an untested claim, and design research is no easy task, especially for students new to the field. However, it is not realistic to expect a worthwhile research topic to simply fall into your lap. Instead, you should systematically search for a research question that is relevant, unanswered, and well suited to your aptitude and interests.

In this lesson, you will learn to find a research topic by:

- Understanding the main areas of research in Technical Communication and related disciplines
- Using the best sources for recent and seminal literature in these areas
- Identifying worthwhile research problems in a given domain
- Translating a research problem into a testable claim about the world

Selecting a research area

A research area is a domain of scholarship with common theoretical foundations and/or practical applications. Technical Communication is an interdisciplinary field, which means that its various research areas overlap with those of other disciplines. Before engaging in research in the field, it is important to familiarize yourself with the various sources of professional and scholarly information in both Technical Communication and related disciplines.

Remember that your research question may change as you research it. You carry out research to learn something new, to answer a question, to solve a problem, or to fill a gap. So, be open to adapting and changing it as your research dictates.

Exploring technical communication

One of the most important things you can do to familiarize yourself with the expansive field of Technical Communication is to stay up-to-date with the five most popular Technical Communication Journals. Your university library most likely subscribes to most, if not all, of the most prolific and respected Technical Communication journal publications. The following are the top five Technical Communication journals and the types of articles in which they specialize:

1. [Technical Communication](#): Published by the Society for Technical Communication, this journal "publishes articles about the practical application of technical communication." It is published quarterly and contains articles that explore results of original research, case studies of technical communication problems and their solutions, tutorials on processes that "respond to new laws, standards, requirements, or technologies," and research and book reviews.
2. [Journal of Technical Writing and Communication](#): Published by Baywood Publishing Company, this journal seeks to meet the "communication needs of industry, management, government, and academia" in order to bridge the gap between professionals and students. Some areas of interest include: audiences analysis, communication management, instructional video, rhetoric, technical journalism, and user documentation, to name a few.
3. [Technical Communication Quarterly](#): Published and supported by the Association of Teachers in Technical Writing, Taylor and Francis, and the Texas Tech University English Department, this journal focuses on technical communication research in "academia, scientific, technical, business, governmental, and related organizational or social contexts." Some article topics include communication design, the role of digital technologies, the practices of publication management, research methods, and dialogue between academics and practitioners.

Exercise:
Instruct students to search for technical communication journals within university research database and find one or two articles to print out and read.



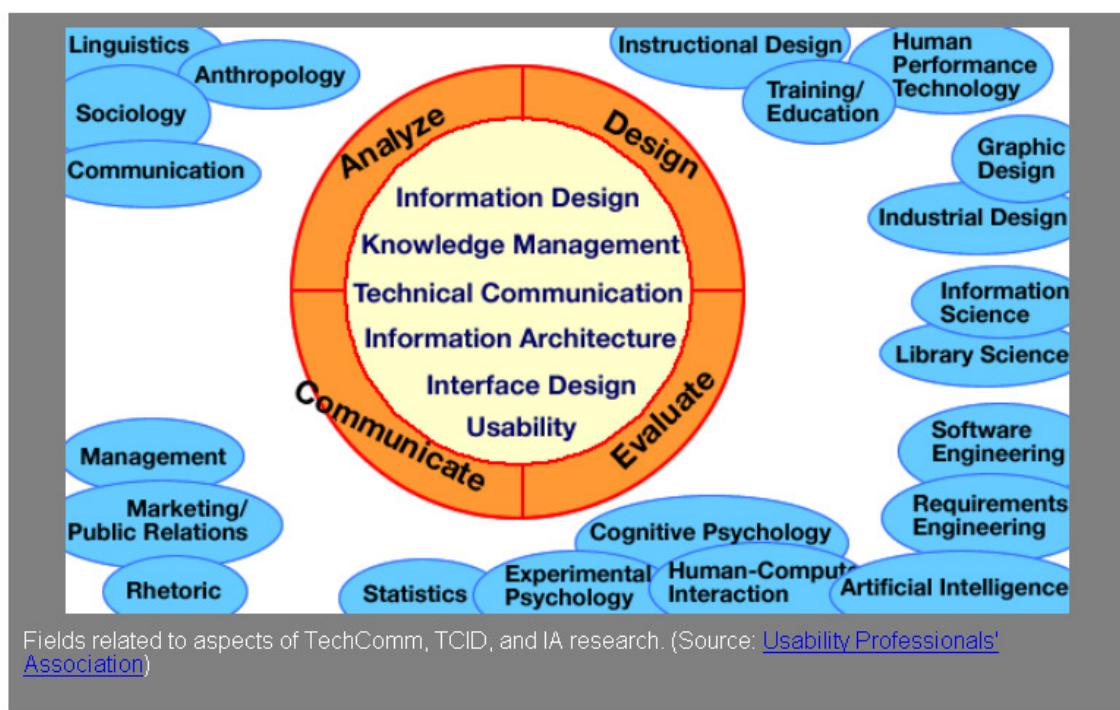
Exploring Technical Communication, cont.

4. [*Journal of Business and Technical Communication*](#): Published by Sage, this journal "provides a forum for discussion of communication practices, problems, and trends in business, professional, scientific, and governmental fields." It also seeks to bridge dichotomies that exist between professional and academic technical communicators. Some common topics include results of research in professional and academic communication, instructional tips and industrial how-tos, opinion pieces that address issues of importance to the technical communication profession, and critical book and software reviews.
5. [*IEEE Transactions on Professional Communication*](#): Published by IEEE Professional Communication Society, "this journal's research falls into three main categories: the communication practices of technical professions, such as engineers and scientists, the practices of professional communicators who work in technical or business environments, and research-based methods for teaching professional communication."

Peruse these journals to inform yourself on the types of research that have been studied extensively and to get a good idea of research topics that seem like they might benefit from further exploration. More often than not, something will spark your interest and inspire you to conduct further studies on a certain topic.

Exploring related disciplines

Conducting research in an interdisciplinary field like Technical Communication can be both fascinating and daunting. **Figure 1** shows (not exhaustively) many of the disciplines and interdisciplines that commonly overlap with Technical Communication, Information Design, and Information Architecture research.



Exercise:

Examine the references of a scholarly article in technical communication or a related field to see how disciplines can overlap in research (You can use: GARNER, J., ALLEY, M., GAUDELLI, A., & ZAPPE, S. (2009). Common Use of PowerPoint versus the Assertion-Evidence Structure: A Cognitive Psychology Perspective. *Technical Communication*, 56(4), 331-345.).



These fields can be grouped according to:

- **Traditional social sciences:** Anthropology, Linguistics, Psychology, Sociology
- **Non-traditional social sciences:** Communication, Information Science, Management
- **Humanities:** Rhetoric, Visual Arts
- **Formal sciences:** Computer Science, Statistics
- **Professions and applied sciences:** Education, Industrial Design, Library Science, Marketing/Public Relations

While these fields can contribute to Technical Communication research, the related areas in which Technical Communication, Information Design, and Information Architecture scholars commonly contribute ideas and research include Human-Computer Interaction (HCI), Instructional Design, Knowledge Management, and Usability. Browse the following sources to learn more about and keep up with current research and development in these interdisciplinary fields:

- **Human-Computer Interaction:** The study of the interaction between users and computing devices.
 - [HCI International](#), a newsletter that provides news from the field of HCI and links to interesting articles and conferences.
- **Instructional Design:** The practice of maximizing the effectiveness and efficiency of instruction.
 - [Training Magazine](#), a publication for training, human resources and business management professionals that "advocates training and workforce development as a business tool."
 - [Instructional Design and Development Blog](#), a collaborative blog maintained by DePaul University aimed at "providing information on enhancing instruction through the use of technology" in post-secondary education.
- **Knowledge Management:** The strategies and practices of capturing, maintaining, organizing, and distributing information.
 - [KM Edge](#), an online resource published by the American Productivity and Quality Center (APQC) on benchmarking, best practices, knowledge management, performance improvement, and professional development.
 - [IK Magazine](#), a magazine written by and for knowledge management professionals.
- **Usability:** The practice of designing and evaluating products for effective user interaction and ease of use.
 - [Boxes and Arrows](#), a "peer-written journal devoted to the practice, innovation, and discussion of design; including graphic design, interaction design, information architecture and the design of business."
 - [Usability Interface](#), a quarterly publication of the STC Usability SIG aimed at providing technical communicators with information on applying usability design and testing techniques to their products.
 - [User Experience](#), a magazine by and about usability professionals and dealing with usability and user experience.

Obviously, this list is not exhaustive, but it provides a starting point for new researchers. It's a good idea to set aside some time each week to skim through the scholarly and/or professional discourse for the area in which you're conducting research. This helps keep you in-the-know about current and important issues that may be relevant to your research. You may even want to find and follow active bloggers in a given topic area on [Twitter](#).



Exploring Related Disciplines, cont.

To get a feel for the type of scholarly work conducted in each of these interdisciplines, read through the abstracts from some well-known peer-reviewed journals using one of the library's research databases.

- Human-Computer Interaction
 - [ACM Transactions on Computer-Human Interaction](#), "covers the software, hardware and human aspects of interaction with computers."
 - [International Journal of Human-Computer Interaction](#), "emphasizes the human element in relation to the systems in which humans function, operate, network, and communicate."
 - [Human-Computer Interaction](#), deals with "the user sciences and system design as it affects individual users, work groups, communities, and social and organizational settings."
- Instructional Design
 - [Educational Technology Research and Development](#), focuses on research and development in educational technology.
 - [Journal of Research on Technology in Education](#), focuses on instructional uses of educational technology around the world.
 - [Journal of Interactive Learning Research](#), concerns the underlying theory, design, implementation, effectiveness, and impact on education and training of various interactive learning environments.
- Knowledge Management
 - [Journal of Knowledge Management](#), focuses on "the identification of innovative Knowledge Management strategies and the application of theoretical concepts to real-world situations."
 - [Knowledge Management Research & Practice](#), "explores knowledge management at the interface between science and policy, and the roles of participation and transparency at this interface."
 - [Journal of Information & Knowledge Management](#), deals with "all aspects of information processing information management and knowledge management."
- Usability
 - [Journal of Usability Studies](#), "dedicated to promoting and enhancing the practice, research, and education of usability engineering."
 - [Journal of the American Society for Information Science and Technology](#), Articles deal with "the generation, recording, distribution, storage, representation, retrieval, and dissemination of information, as well as its social impact and management of information agencies."



Important considerations

As you select a research area in which to develop worthwhile research questions, make sure you:

1. Have a genuine interest in the area.

Remember: Don't just settle on a research area that seems very popular at the moment (i.e. unstructured information retrieval in early 2000s) or very convenient (you have access to a particular sample population or research tool) or easy (probably not as easy as you think). You're going to be spending a lot of time and energy on the topic, and it's going to be a lot easier to stay motivated if you're actually interested in what you're reading and writing about.

2. Do the background reading necessary to fully understand the relevant topics and concepts.

1. Familiarize yourself with the field or area's **seminal works** by searching research databases for the most cited articles for a given journal or keyword search. However, it's important to read what (at least some) others have written about the work because some research is widely cited due to its mistakes.
2. Familiarize yourself with the field or area's recent research topics by browsing the library's current journals or searching keywords in [Google Scholar](#) (limit to the last 3-5 years). Google Scholar is a great source for recent conference proceedings, which usually can't be found in research databases.

Identifying a gap in the literature

Once you have found a promising research area of interest, you must identify research questions that are not only unresolved but whose exploration can meaningfully contribute to existing theory and/or practice.

In this section, you will learn to identify such promising research questions by avoiding common beginner's mistakes, understanding how to identify a "gap" in the scholarly literature, and making sure it is worthwhile to try to fill the gap.

Don't get ahead of yourself

Because many graduate students are relatively inexperienced in designing and conducting original research, they can forget that research questions must be formulated before determining the most appropriate research method or focusing on the type of data to be collected. For example, the researchers in Scenario 1 and Scenario 2 make the mistake of not determining the research questions first. The researcher in Scenario 3, on the other hand, wisely bases her research design on the nature of the research questions.

Don't decide on a research method or focus on the data to be analyzed before finding the research problem.

If necessary, remind students that if they love their topic too much, they will have to guard against blind spots that may arise from their personal investment in it. Urge students to assess what is at stake for them in researching the topic and to be aware of human influence and biases they may have because of their interest in the topic. Finally, ask them how they carry out research without letting their strong emotions on the topic cloud the research



Scenario 1: Jane would like to conduct a content analysis for her master's thesis project. She decides to investigate how the characteristics of online gaming walkthroughs affect online community response. Since she is doing a content analysis, Jane decides to collect data on text features such as reference to self, use of jargon, use of sentence fragments, etc.

Why constrain the analysis to word- or phrase-level data? Jane should consider using discourse analysis, a method in which the object of analysis is the whole piece of writing.



Scenario 2: John is interested in software tools that track users' line of vision as they navigate digital interfaces. Since such tools track patterns of users' visual focus, he decides to find out how users' interactions with social networking sites differ based upon differences in these patterns.

Users' visual focus patterns provide only a limited view of their interaction with a system. John should think about using click-through data or individual user account activity data.

Exercise:
Use first two scenarios to engage in class discussion on how to revise each researcher's approach. There is more than one right answer.



Scenario 3: Kristy is interested in how information architecture decisions on educational websites affect self-directed learning behavior. Since she is interested in comparing the detailed behavior of many users across 6-10 different websites, Kristy decides to collect the lesson log data and survey data from users who agree to participate in the study.

Based on her research question, Kristy determined which data to collect. She then based her research method (survey, log transcript analysis) on the desired data and other practical considerations.

Examples based on: Karreman, J., van der Geest, T., & Buursink, E. (2007). Accessible Website Content Guidelines for Users with Intellectual Disabilities. *Journal of Applied Research in Intellectual Disabilities*, 20(6): 510-518.; Kock, N., Chatelain-Jardón, R., & Carmona, J. (2008). An Experimental Study of Simulated Web-Based Threats and Their Impact on Knowledge Communication Effectiveness. *IEEE Transactions on Professional Communication*. 51 (2), 183.; Katz, A., Lenhardt, M., & Mitchell, K. (2007). On Acknowledging Thanks for Performing a Favor. *Metaphor & Symbol*, 22(3), 233-250.; Coventry, K. R., Lynott, D., Cangelosi, A., Monrouxe, L., Joyce, D., & Richardson, D. C. (2010). Spatial language, visual attention, and perceptual simulation. *Brain and Language*. 112 (3), 202.



What is a gap in the literature?

A gap in the literature is a research question relevant to a given domain that has not been answered adequately or at all in existing peer-reviewed scholarship. A gap in the literature may emerge if:

1. The question has not been addressed in a given domain, although it may have been answered in a similar or related area.

Example: Existing theories on collaborative learning suggest that peers utilize one another's knowledge and skills as a means to gradually move toward independent problem solving. However, when online distance learning first emerged, it was not yet known whether or how email and bulletin board posts could similarly facilitate collaborative learning, necessitating the research question, "How does collaborative learning occur through asynchronous textual communication?"

2. The question has never been asked before, but it now merits exploration due to changes in accepted theory, data collection technology, or culture.

Example: A study uses new eye tracking software to determine how spatial language descriptions direct people's judgements and parsing of a visual scene. Eye tracking allows researchers to observe exactly how attention is allocated in visual scenes over time, affording a way to test an existing attention model.

3. The question has been asked and tested in peer-reviewed research, but the methods were either of questionable validity or had necessitated limited applicability of results. Alternatively, a replication study could be run to verify a published study's results if appropriate.

Example: A published study tested whether adapting website content to be accessible to persons with intellectual disabilities according to established guidelines significantly affect its usability for persons with and without intellectual disabilities. The results were mixed, but the study was criticized for not employing more finely grained independent variables (i.e. word choice, syllable count). Thus, a new study may ask, "How do variations in grammar construct use affect website content comprehension among intellectually disabled users?"

Why does it matter?

Even if a legitimate gap in the literature exists, it does not necessarily mean that the research question(s) merits pursuit. To justify to yourself and others the investment of time and energy into designing and conducting research, you must ensure the research will likely have valuable practical and/or theoretical implications.

1. Practical implications: Answering the research question could improve existing practice and/or inform professional decision-making.

Example: A study investigating the effect of the incorporation of a "threat condition" in computer-mediated communication on users' long-term memorization of content could potentially apply its findings to risk communication design (if threat conditions were found to enhance long-term memory in CMC).

2. Theoretical implications: Answering the research question could revise, build upon, or create theory informing research design and practice.

Example: A study on how the use of expressed thanks for performing a favor serves a role in establishing and maintaining relationships contributes to existing theory of phatic (non-informational) information use in humans.

Exercise:
To get students used to reading scholarly literature, you can assign them to read and briefly summarize any of the actual articles on which the examples are based (See Notes).



Formulating a claim

In research design, the researcher must formulate a testable hypothesis. Thus, a good research claim must do three things:

1. The claim must make an argument about the way the world works.
2. The claim must be testable against observable data.
3. The researcher must be able to draw conclusions from the testing of the claim.

The following scenarios provide examples of good and bad claims in each of these three aspects.

Making an argument about the way the world works



Claim 1: Since John wants to find out how users' interactions with social networking sites differ, he forms the following claim: "Users interactions with social networking sites differ among different types of sites."

This claim says nothing about how or why users behave in different types of sites. Moreover, its answer is obvious (users' interactions probably do differ) and, therefore, the hypothesis is uninteresting. Who cares if users' "interact differently"?



Claim 2: Since John wants to find out how users' interactions with social networking sites differ, he forms the following claim: "Users have narrower and deeper social networks in recommendation-based sites than in sites oriented toward connecting with friends."

This claim makes a specific but not self-evident argument about how users behave on social networking sites.

Exercise:

Use each of the bad claims to start a class discussion. Ask students to first critique the claim, then provide suggestions for improvement.



Being testable against observable data



Claim 3: Jane is interested in how the characteristics of online gaming walkthrough instructions affect online community response to them, so she forms the following claim: "Walkthroughs with an objective, or non-editorial, tone facilitate more efficient understanding among readers."

This claim is not testable. Even by surveying or conducting in-depth interviews of walkthrough readers, it is not possible to measure "efficiency of understanding." The technology does not exist to observe or quantify the rate at which humans understand communicated information.



Claim 4: Jane is interested in how the characteristics of online gaming walkthrough instructions affect online community response to them, so she forms the following claim: "Walkthroughs with an objective tone are perceived to be more authoritative than those with an editorial tone."

This claim is readily testable. Test subjects' perception is often measured through survey or interview techniques, although it is important to remember that subject perception of authoritativeness is not necessarily equivalent to actual authoritativeness.

Drawing conclusions from the claim's testing



Claim 5: Since Kristy is interested in how information architecture decisions on educational websites affect self-directed learning behavior, she forms the following claim: "Educational websites with prominent topical organization tend to be utilized as a secondary reference tool rather than a primary learning resource."

This claim is too complex because it predicts the goal and nature of users' behavior. As a result, it essentially asserts the conclusion to be drawn by the researcher. A better approach would be to break this claim down into simpler, more easily testable claims.



Claim 6: Since Kristy is interested in how information architecture decisions on educational websites affect self-directed learning behavior, she forms the following claim: "Educational website users tend to associate topical organization with reference resources and sequential organization with active learning resources."

This claim makes a testable argument about user perceptions. Through testing, Kristy can draw conclusions about how users build context through the information architecture on educational websites. Ideally, this will lead to new questions and claims to be tested in future research.

Exercise:

In groups, have students come up with claims relating to their own research interests (or assigned hypothetical scenarios). Then, have the class critique the claims.



Finding a research topic quiz

Greg needs to find a research topic for his master's thesis. He's interested in how the interface design of mobile devices affects user experience, but he isn't very familiar with scholarly literature in the area.

Instructions: Based on the above scenario, read each question and select the best option according to the best practices and concepts described in the previous lesson.

1. How can Greg learn about recent developments and current research in this area?

- Use Google Scholar to search key terms
- Subscribe to HCI International newsletter
- Browse the abstracts of recent issues of the *International Journal of Human-Computer Interaction*
- All of the above

2. Which research topic should Greg pursue based on his impression of it?

- "I could research how University students use mobile devices to supplement their academic learning since I have easy access to a sample of this user population."
- "A great deal of recent research pertains to cultural differences in the usability of different interfaces. Maybe I could translate this idea to mobile devices."
- "I'm really interested in which types of interfaces tend to foster self-directed learning, but there doesn't seem to be any existing literature on this topic."

3. Which is the best way for Greg to start his research design process?

- Start with the research method with which he feels most comfortable.
- Identify the types of data found in the topic area of interest.
- Find a research problem that merits pursuit.

4. Which is the best reason for Greg to pursue a given research question?

- Findings could contribute to best practices guidelines for mobile device interface design.
- Findings could provide insight into how University students use mobile devices differently than the larger population.
- Findings could fill a gap in the literature on how mobile interface design influences self-directed learning.

5. Which of Greg's claims is well designed?

- University students use mobile devices to supplement their academic learning.
- High-context-culture users tend to perceive only the topical aspect hierarchical organization schemes.
- Mobile interfaces with three or fewer organization schemes facilitate more efficient understanding among users.



Realistic Research: University, Web-based, and Local Resources

Purpose

This lesson is meant for students who must begin research in their first semester of the TCID or the Ph.D. in Technical Communication program who want to develop, improve, or refresh their research skills. Additionally, this lesson is designed to give students strategies which will help them research more efficiently.



Content Areas

This lesson will help you learn to acquire research resources through a review of the following areas:

Getting Started

- Learn how to access IIT library services
- Learn basic functionality on the IIT library website

Research Timelines

- Learn how to formulate a timeline
- Learn how to use your timeline to determine the best way to obtain resources

Requesting Resources

- Learn how to request articles from other libraries
- Learn how to request books from other libraries

Local Libraries

- Learn how to access local libraries
- Learn when to utilize local libraries over interlibrary loan

Finding Resources on the Web

- Review web-based research tools and their uses

After you read the above sections, you will be directed to a short quiz which will help you reflect on the strategies presented in this lesson. If you are lost at any point or want to go back and review previous sections, there is a table of contents link in the upper right hand corner of each page that will take you to any point in the lesson. Words or phrases highlighted in red and underlined like this will display additional information if you hover your mouse pointer over them.

You might begin by having everyone go around the room and describe their previous research paper writing experience.

- Has anyone written a research paper in Tech Comm before?
- What did you learn from that experience?



Getting Started

Goals for this section

- Learn how to access IIT library services
- Learn basic functionality on the IIT library website

As with most guided activities in this section, it is a good idea to ask students if they have used IIT services before. This will help mitigate disinterest or boredom from more experienced students.

Accessing Library Services

If you are a newly admitted student and you have not obtained an IIT Hawk Card, details for doing so can be found at the [Hawk Card Homepage](#). You will need your Hawk Card number to access some library services

Even if you don't have a Hawk Card, you can still access online journals and perform all of the search functions through the library website. You will only need your Hawk Card to check out materials in person at the Galvin Library or request materials through interlibrary loan. Let's take a look at how to get started.

Students in your course will probably have obtained an ID card, so you should feel free to skip this section.

Using myIIT to Access the Library Website

Although you can search for research materials through the library website directly, the best way to access the library website is to first log on to [myIIT](#). Once you are logged in, you will see a link to "Library Resources." Try logging in, and clicking on that link.

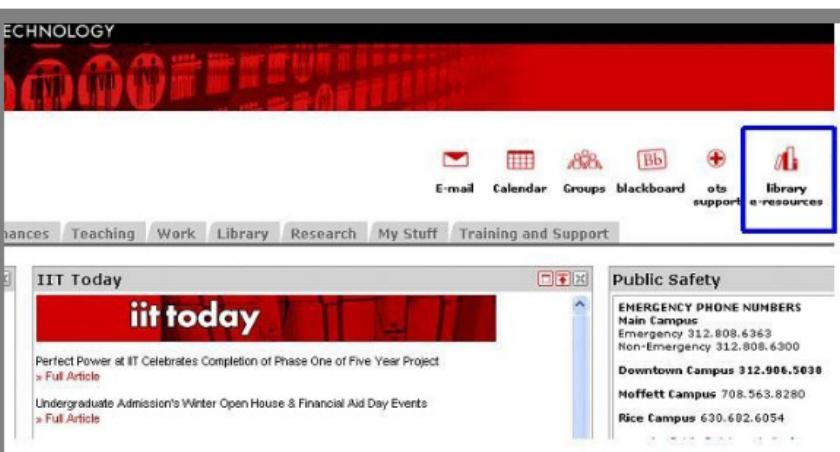
Have students perform these actions with you. Be prepared to stop to assist students who are unable to log in. Ask students who are having difficulty to look on with another student if you cannot troubleshoot the problem.

Accessing the library website through [myIIT](#) allows a proxy server connection which will enable you to access most resources without reentering your login information.

Once you are at the library website, you will see a variety of search options available on the left-hand navigation bar:

The best place to begin researching is in a scholarly database that allows you to search multiple scholarly journals at once, such as Academic Search Premiere (EBSCO).

An example you can give students would be logging into a Google or Yahoo account and being able to access affiliated services without logging in again.



The screenshot shows the myIIT homepage with a red banner at the top. Below the banner, there is a navigation bar with links for E-mail, Calendar, Groups, blackboard, ots support, and a blue box labeled "library e-resources". On the left side, there is a sidebar with links for Enhances, Teaching, Work, Library, Research, My Stuff, Training and Support. The main content area features a "IIT Today" section with news items about Perfect Power at IIT and Undergraduate Admissions. To the right, there is a "Public Safety" section with emergency phone numbers for Main Campus, Downtown Campus, Moffett Campus, and Rice Campus.

The Library Services icon leads you to the library search website.

You may want to run a sample search at this point to show how EBSCO works. It will also set you up to demonstrate how to request an article later in the lesson.



Research Timelines

Goals for this section

- Learn how to formulate a timeline
- Learn how to use your timeline to determine the best way to obtain resources

Formulating a timeline

It is important to first consider your due date when thinking about requesting resources. You must have enough time to read the material, integrate it into your project or paper, and still have time to finish your assignment. In general, consider this formula when determining whether it is realistic to use a resource for your paper:

Time to obtain resource + Time to read resource + Time to integrate resource into your project <

Remaining time before deadline

Let's unpack some of those terms

- **Time to obtain resource:** How long will it take for the resource to arrive via interlibrary loan? -or- How long will it take for you to physically obtain the resource?
- **Time to read resource:** How long will it take you to read the book or article? Are you at a point in your project where you must begin to write if you want to finish on time?
- **Time to integrate resource into your project:** Even if you are able to read the resource, do you have enough time to identify pertinent information and incorporate that information into your project? If your paper is already written, do you have enough time to restructure it to allow for discussion of this resource, or would it simply be better to indicate your awareness of the resource with an explanation that time constraints prevented you from including it?
- **Remaining time before deadline:** How much time is left before you must turn in your project? Is your resource powerful enough to cause you to rethink your approach to your topic? If so, requesting an extension might be in order.

Case Study: Example of a Research Timeline

Bridgette is a graduate student in the Tech Comm program who has been assigned a literature review and research paper for a graduate course. She's decided to research the development of technical communication as a field between the beginning of the twentieth century up to World War II.

Her first move is to begin researching by logging into myIT and searching for articles using scholarly databases like EBSCO and JSTOR. After conducting some research, she finds several articles that are pertinent to her search topic, but are not available as a .pdf download through those databases. She knows that she must decide whether it is worthwhile for her to request those resources or to move on and look for resources that are more easily available. To do this, she constructs a research timeline.

Being Realistic

Don't assume that you can read an entire scholarly book in one day. You're only fooling yourself and wasting your precious time if you try to obtain resources that you can't possibly hope to read within your research timeline.

For the case studies in this lesson, you can always ask students if they have had a similar experience. Also, see if they can think of alternate approaches those exhibited here or apply the concepts covered here to projects that they are working on.



Research Timelines, cont.

Having conducted research projects before, she knows that she need not write down her timeline, but she decides to set reasonable goals and record them in her Google calendar so that she has an idea of when certain elements of her project should be completed. She first concludes that she has started with plenty of time to request any resources that she needs to complete the project, and that she will have sufficient time to wait for resources to arrive, read them, and incorporate what she has learned into her paper before she must turn in her final copy. She decides to read these articles when they arrive, and then expand her research to cover her topic as appropriate.

Determining the best way to obtain resources

Even if you can obtain a resource, that doesn't mean you necessarily should spend your time doing so. Be sure to preview a resource by reading a book review or previewing the book on Google Books to make sure that it is valuable enough to obtain. If you have determined that it is feasible and worthwhile to obtain a resource within the timeline you have developed, you must next consider how to obtain that resource.

In general, the safest way to obtain resources is to physically obtain a copy yourself. However, that is often inconvenient, impractical, or unnecessary. In cases such as those, interlibrary loan or MyILL is your best option. However, interlibrary loan can take time. Consider these guidelines when requesting your resource through interlibrary loan or MyILL.

It would be a good idea to ask students to come up with an example of a book review or Google books preview here.

- **The stated turnaround time**

Problems can and do occur in transmitting library materials. For safety's sake, ask yourself the following question: "If it were to take twice as long as the stated turnaround time on the website, would I still have enough time to utilize the research?" Consider all of the factors in the formula above. If not, seek an alternative to interlibrary loan or MyILL.

- **The proximity of the lending library to your location**

In the case of MyILL, articles are delivered exclusively online. However, if you are using WorldCat, your lending library may be located in Wisconsin, or it may be located in Canada, or Bulgaria, or Hong Kong. While chapters might be sent electronically, it takes time for books to be delivered from WorldCat libraries. Check the location of the lending library and take it into consideration when requesting materials from WorldCat.

- **The possibility that your materials may not arrive before your deadline**

Can you complete your project without these materials? If you are still in the planning or topic selection phase, check for these materials and consider whether you will have enough time to utilize them in your project. If not, it would be wise to consider an alternative topic.



Requesting Resources

Goals for this section

- Learn how to request articles from other libraries
- Learn how to request books from other libraries

Requesting Articles

Occasionally, you will notice that some articles are not available for download as a .pdf file through a journal or academic search engine, as is the case in the figure below:

The screenshot shows the EBSCO Academic Search Premier interface. The search bar contains the query "Integrating Digital Literacies into Outreach Services for Underserved Youth Populations". Below the search bar are two dropdown menus for "Select a Field (optional)" and "Add Box". The left sidebar includes filters for "Source Types" (All Results, Academic Journals, Magazines, Newspapers, Books/Microforms, Educational Reports, Subject Thesaurus Term, OUTREACH programs, MEDICAL care), and a "Narrow Results by" section. The main results area displays two items:

1. **Integrating Digital Literacies into Outreach Services for Underserved Youth Populations.** By: Adeyemo, Ernestine. *Reference Librarian*, Jan/Mar2009, Vol. 50 Issue 1, p85-98, 14p; DOI: 10.1080/02768070902546423; (AN 3643820) Database: Academic Search Premier
2. **after school mobile literacy: serving youth in underserved neighborhoods.** By: Diaz, Rebecca. *Teacher Librarian*, Feb/2009, Vol. 36 Issue 3, p37-38, 2p; (AN 36953452)

Get Article link will direct you to a page like this, where you will either be able to retrieve the article through another web site or where you will request the article through your myILL account.

The screenshot shows a library website for PAUL V. GALVIN LIBRARY. At the top, it says "Use the options below to locate a copy of this item". Below that, there are sections for "Basic", "Online Full Text" (which is unavailable), "Interlibrary Loan" (with a "Request item via MyILL" button), and "Get Help" (with a "Report problems or other issues with SFX using this Feedback Form" button). Under "Advanced", there is a "Web Search" section with fields for "Search for this item in Google Scholar" and "Article Title" and "Search Terms" (both containing the query "Integrating Digital Literacies into Ou").

For this resource, the only option is to request the article through MyILL

delivered items. For more help requesting articles, see the [Library FAQ and How-to Pages](#).

The EBSCO example you showed previously can be used again here, provided that not all articles are available in .pdf format (i.e. you must be able to request one of the articles through MyILL).

Clicking on the

You will want to have students follow you here so that they will be able to follow the steps and set up their MyILL account during the lesson.

Your myILL account requires a separate setup from your myIT account, so you will need to register before you are able to request an article. Think of myILL as asking a friend to make a copy of an article for you, because that is essentially what you are doing. You will be notified by email when your article is ready to download, and you can log into myILL and view your page of

Show the students this page.



Requesting a Book From Another Library

When searching for a book, it is best to begin by searching the IIT library system. If you are unsuccessful in finding the title you are looking for, next try to locate the book in [I-Share](#). If I-Share yields no results, the next step is to search for your book in [WorldCat](#).

If you are confused when using any of the library systems, you can always refer back to the [Library FAQ and How-to Pages](#) which have a selection of tutorials explaining the step-by-step instructions for requesting resources.

Case Study: Searching and Requesting Resources

Bridgette receives the articles that she has requested and reads through them. One of the resources that Jane finds quoted often in academic papers is the 1923 text *English for Engineers* written by S. A. Harbarger. She decides that this is a useful resource to examine for her project, and makes a note of the title, author, and year in her Google Docs list of resources that she is compiling. After a quick search in I-Share, she notices that it is available at the University of Illinois library in Chicago; she makes a note of this as well in her list of resources. Although she has to work on another project, she knows that she can easily come back to her research notes and resume work.

Being Realistic

When collecting resources, don't assume that you will remember any of the titles you look up or that you will be able to find them again using past searches. Keep a list of resources on Google Documents or on your flash drive.

Local Libraries

Goals for this section

- Learn how to access local libraries
- Learn when to utilize local libraries over interlibrary loan

Local Libraries

There are two types of local libraries that may contain your resources:

- Other university libraries belonging to I-Share
- Public libraries

I-Share Libraries

Many I-Share libraries will allow you to pull books directly from the shelf and check them out instantaneously so long as you can present your IIT ID card and there are no holds on your library account. Daley Library at the University of Illinois at Chicago (UIC) has an [open stacks](#) policy. UIC is also a [Research I institution](#), so their library is quite extensive.

A good accompaniment to this section would be to demonstrate the search functions in the three library catalog interfaces mentioned here (time permitting). If you demonstrate an example of an I-Share search, you can use it in the next part of the lesson, Local Libraries, to give some examples of I-Share libraries.



Not all area libraries belong to the I-Share system. For instance, Loyola University and the University of Chicago do not participate in I-Share. You may check out books, but only under certain conditions. You may not enter their facilities or browse their collections.

If you plan on visiting an I-Share library to obtain your resource, consider the following:

- **Where is the library located?**

Will you have to travel outside of Chicago? If so, consider interlibrary loan.

- **Can you enter the library?**

Ask if the library is open to the public. Although you are a registered student at an I-Share institution, different libraries have different rules about who can browse their book stacks.

- **What are the library hours?**

Not every institution uses the semester system. DePaul University, for instance, uses the quarter system, so their school is closed at different times than IIT. Check the library website to verify hours

Being Realistic

Don't waste your research time by making the trip to a library only to find out it is closed for break or you are not allowed to browse the stacks as a non-student. When in doubt, call first.

Using the previous example of an I-Share search, you can give a specific example of a local library and run through the checklist.

Public Libraries

The [Chicago Public Library](#) (CPL) system is extensive, and contains a great deal of books that are in popular demand or hard to obtain from I-Share libraries (e.g. textbooks). If you do not live in Chicago, you cannot check books out of the library, but you can visit the library and read or copy the books. Most local libraries have similar policies. Visit a CPL location to obtain a library card (you will need to present proof of residency).

Case Study: Obtaining a Resource from an I-Share Library

After finishing another project, Bridgette returns to her research paper on Tech Comm prior to World War II. She notices that she had made a note to obtain *English for Engineers* by S. A. Harbarger, but that was over a week ago and she now only has ten days left to finish her paper. She decides to reassess her research timeline and concludes that she has enough time to read, analyze, and incorporate important elements of this resource into her paper, but in order to do so, she must have the resource and begin working immediately.

Recognizing the need for an adjustment in the amount of time it takes her to obtain the resource, she decides to attempt to pick up the book herself from a local library. She sees a note she made that the book is available at the UIC library; since she has the title, author, local library, and call number, she is ready to proceed to the library. Prior to leaving, however, she checks the hours and policies of the UIC library on their website so she doesn't waste a trip.

Run through an example search to demonstrate how to find a book. From there, you can show them how to find availability information and location of CPL branches.



When to Use Local Library Resources Instead of Interlibrary Loan

There are two situations where you should consider obtaining your resource through a local library rather than relying on interlibrary loan:

1. You no longer have enough time to wait for an interlibrary loan book to be delivered
2. You cannot obtain the book through interlibrary loan because it is not available

It is important to remember that CPL volumes are *not* listed in I-Share holdings information. Even though public libraries are located in Illinois, they do not participate in the I-Share system, so you must search at the CPL website to view available titles.

Emphasize this point for clarity.

In the final section of this lesson we'll explore the best way to obtain resources, the internet.

Internet Resources

Goals for this section

- Review web-based resources and their uses

Some resources to consider

If you can obtain the same resource online, why request it? Some resources that are available online include:

- Public domain writings
- Resources licensed under Creative Commons
- Media files such as video, audio, and images

In general, if you can avoid making a trip to the library, you can save yourself time when researching

Ask the students to come up with examples. Often, students do not understand the concept of copyrights, so you might explain that here.

Using Web Resources for Research

Some web resources can help you find additional resources, such as the following:

- [Google Scholar](#)
Allows you to search for scholarly articles and view which articles are cited by other articles
- [Google Books](#)
Allows you to view a preview of a book, or in some cases, the entire book, including the references section
- [Web of Science](#)
Similar to Google Scholar, but for scientific papers

Time permitting, show these sites to students, or ask a volunteer who is familiar with them to demonstrate a search for the rest of the class.



Case Study: Using Web Resources

Near the completion of her research project, Bridgette starts to question some of the arguments in a central article in her paper, "The Rise of Technical Writing Instruction in America" by R.J. Connors (1982). She wants to see if other researchers have included atypical examples of technical writing instruction in their papers about the rise of technical communication as a discipline before World War II. Thinking that most articles written on this topic will have referenced Connors' article, she types the title into Google Scholar. She notices that Connors' article has been cited 62 times. From there, she searches the articles that cite Connors' article for the examples she is looking for.

That's it!

Hopefully you learned a little bit about conducting research and obtaining resources. Remember, if you start researching early enough, you are not limited to only those resources that you can find online. Now that you have read these suggestions for researching, please take a short quiz to help you retain some key points from this lesson.

Being Realistic

If you're stuck when researching a topic in technical communication, try searching for a special issue, yearbook, or edited volume on your topic. Collections such as these offer you a wealth of resources and represent a snapshot of collective scholarship on a topic, which can help you determine how your own topic relates to that research.



Realistic Research Quiz

Instructions: To help you retain some of the strategies you learned in this lesson, read the research scenario below and answer the questions on how the student should proceed

Jane Student has been assigned to compile a literature review and research paper for a graduate course in the Tech Comm program.

— **What's the best place for Jane to start searching for scholarly resources?** —

- Academic Search Premiere (EBSCO) and Google Scholar
- The IIT Library Website
- A Google Search

One of the resources that Jane finds quoted often in academic papers is the 1923 text *English for Engineers* written by S. A. Harbarger. She notices that it is available at the University of Illinois library in Chicago.

— **Which option is not a valid way of obtaining the resource?** —

- Requesting via interlibrary loan
- Visiting the library and checking out the book in person
- Requesting a .pdf copy of the book

— **How can Jane check to see if this book is worth her while to obtain?** —

- Find a summary online
- Read a book review
- View a preview on Google Books
- All of the above

Jane spent too much time watching TV and not enough time obtaining her resources. As a result, she only has one week to obtain her resources, read them, and write her paper. Due to the time constraints, she decides to pick the book up in person from the IShare library rather than rely on interlibrary loan.

— **Before Jane leaves for the library, what should she do?** —

- Check the library hours and access privileges
- Determine whether the resource is valuable enough to her research to spend her limited time obtaining it
- Decide whether she can actually read and integrate the material from the research into her paper
- Carefully consider all of the above factors, and then realistically assess whether this book fits into her new research timeline



How to organize and analyze research data

This short lesson is intended for graduate and advanced undergraduate students undertaking original research projects. After completing the 30-minute lesson, you will be able to:

- Format raw research data in an Excel spreadsheet for efficient analysis
- Run basic descriptive statistics in Excel
- Prepare the document for statistical analysis in the software package PASW

Format data for analysis

Make sure your computer has Microsoft Excel. Open the document [ToolBox_DataLesson.xls](#) in Excel and follow along with the lesson, taking action as instructed.

In the Raw_Dataset spreadsheet, the name of each variable has been entered in the first row of each column.

- Each variable name must be different from other variable names.
- The first variable (in column A) is a **unique identifier**.
- Variable names must start with a letter (not numbers or special characters), so change *4tutorial_types* to *tutorial_types*.
- Name variables so that they are intuitive to you. Therefore, change *use* and *useful* to *perc_ease_of_use* and *perc_usefulness*, respectively.
- Your spreadsheet should look like Figure 1, and it should now be readily apparent that Column F refers to *Perceived Usefulness* and Column G refers to *Perceived Ease of Use*.

	A	B	C	D	E	F	G	H
1	user_ID	tutorial_types	gender	per_enjoy	perc_usefulness	perc_ease_of_use	exp_level	tasks_comp
2	1	Free play	M	0.875	0.75	0.5625	Low	Y/Y/Y
3	2	Inquiry devel.	F	0.9375	0.75	0.625	Medium	N/Y/Y
4	3	Feature-focus	female	0.875	0.625	0.625	High	Y/N/Y
5	4	Social prompt	M	0.9375	0.75	0.75	High	Y/Y/Y
6	5	Free play	M	0.6875	0.875	0.875	High	N/N/N
7	6	Inquiry devel.	M	0.75	0.75	0.6875	Medium	Y/N/N
8	7	Feature-focus	F	0.8125	0.6875	0.6875	Medium	N/Y/N
9	8	Social prompt	M	0.9375	0.625	0.625	Low	N/Y/Y
10	9	Free play	F	0.8125	0.75	0.6875	High	N/N/Y
11	10	Inquiry devel.	F	0.9375	0.75	0.75	Medium	Y/N/Y
12	11	Feature-focus	M	0.9375	0.625	0.625	Low	Y/N/Y
13	12	Social prompt	F	0.8125	0.5625	0.8125	Low	Y/N/Y
14	13	Free play	F	0.75	0.5625	0.9375	Medium	Y/Y/Y
15	14	Inquiry devel.	M	0.875	0.6875	0.6875	Medium	N/N/N
16	15	Feature-focus	F	0.8125	0.6875	0.6875	High	Y/N/N
17	16	Social prompt	F	0.8125	0.625	0.625	Low	N/Y/N
18	17	Free play	M	0.75	0.75	0.75	Medium	Y/Y/Y
19	18	Inquiry devel.	M	0.875	0.75	0.75	Medium	N/N/N
20	19	Feature-focus	F	0.8125	0.625	0.875	Medium	N/N/N

Figure 1. The user_ID variable is the unique identifier.

For this lesson, you'll need the following:

- Microsoft Excel
- PASW (formerly SPSS) statistics software, or [free trial download](#)



You should already be familiar with:

- The basic functions and tools of Excel
- Descriptive statistics and inferential statistics
- Research design and how to identify independent variables and dependent variables

Review the definitions and purposes of the variable and statistic types as necessary.



Format data for analysis, cont.

1. Decide on input conventions and stick to them. In *gender*, change the "female" value to "F".
2. Separate data into component values whenever possible by adding new columns. For example, *tasks_completed* values (Y/Y/N) can be broken up into three components. So, add columns *task1*, *task2*, and *task3*, and reformat values appropriately.
3. Double-check to ensure no data entry errors have been made, then delete the old *tasks_completed* column.
4. Your Raw_Dataset spreadsheet should now look like Figure 2.

	A	B	C	D	E	F	G	H	I	J
1	user_ID	tutorial_types	gender	per_enjoy	perc_usefulness	perc_ease_of_use	exp_level	task1	task2	task3
2	1	Free play	M	0.875	0.75	0.5625	Low	Y	Y	Y
3	2	Inquiry devel.	F	0.9375	0.75	0.625	Medium	N	Y	Y
4	3	Feature-focus	F	0.875	0.625	0.625	High	Y	N	Y
5	4	Social prompt	M	0.9375	0.75	0.75	High	Y	Y	Y
6	5	Free play	M	0.6875	0.875	0.875	High	N	N	N
7	6	Inquiry devel.	M	0.75	0.75	0.6875	Medium	Y	N	N
8	7	Feature-focus	F	0.8125	0.6875	0.6875	Medium	N	Y	N
9	8	Social prompt	M	0.9375	0.625	0.625	Low	N	Y	Y
10	9	Free play	F	0.8125	0.75	0.6875	High	N	N	Y
11	10	Inquiry devel.	F	0.9375	0.75	0.75	Medium	Y	N	Y
12	11	Feature-focus	M	0.9375	0.625	0.625	Low	Y	N	Y
13	12	Social prompt	F	0.8125	0.5625	0.8125	Low	Y	N	Y
14	13	Free play	F	0.75	0.5625	0.9375	Medium	Y	Y	Y
15	14	Inquiry devel.	M	0.875	0.6875	0.6875	Medium	N	N	N
16	15	Feature-focus	F	0.8125	0.6875	0.6875	High	Y	N	N
17	16	Social prompt	F	0.8125	0.625	0.625	Low	N	Y	N
18	17	Free play	M	0.75	0.75	0.75	Medium	Y	Y	Y
19	18	Inquiry devel.	M	0.875	0.75	0.75	Medium	N	N	N
20	19	Feature-focus	F	0.8125	0.625	0.875	Medium	Y	N	N
21	20	Social prompt	M	1	0.5	0.8125	High	N	Y	N

Figure 2. Values for each variable are entered in a consistent format.

Replace categorical data values with "0" or "1" (0=no, 1=yes) to indicate whether or not the value is represented for the given subject/item. This makes the categorical values **dichotomous**, which gives the researcher maximum flexibility in testing for relationships or correlations.



Format data for analysis, cont.

1. Copy the Raw_Dataset values into the Sheet2 tab. Rename this sheet Formatted_Data.
2. In the Formatted_Data sheet, add new columns with **Insert > Columns** for each distinct value in categorical data columns (*tutorial_types*, *gender*, *exp_level*, *task1*, *task2*, and *task3*). You do not have to add a new column for *task1*, *task2*, and *task3* because their values are already dichotomous.
3. Rename columns according to each possible categorical value. Copy and paste the values from the original column.
4. Replace dichotomous data values with "0" or "1" (0=no, 1=yes) using the replace function: **Edit > Replace**.
5. Your Formatted_Data spreadsheet should now look like Figure 3.

Dichotomous variables allow for the easy isolation of characteristics for analysis. For example, separating experience levels allows the researcher to test in PASW whether subjects with low experience have perceived ease of use scores significantly different from those with medium and high experience levels.

Using the dataset, create additional hypothetical scenarios illustrating the benefit of making categorical values dichotomous.

	A	B	C	D	E	F	G	H	K	L	M	N	O	P
1	user_ID	free_play	inquiry_dev	feature	social	male	female	p	exp_low	exp_med	exp_high	task1	task2	task3
2	1	1	0	0	0	1	0	1	0	0	0	1	1	1
3	2	0	1	0	0	0	1	0	1	0	0	0	1	1
4	3	0	0	1	0	0	1	0	0	0	1	1	0	1
5	4	0	0	0	1	1	0	0	0	0	1	1	1	1
6	5	1	0	0	0	1	0	0	0	0	1	0	0	0
7	6	0	1	0	0	1	0	0	1	0	1	0	0	0
8	7	0	0	1	0	0	1	0	1	0	0	0	1	0
9	8	0	0	0	1	1	0	1	0	0	0	0	1	1
10	9	1	0	0	0	0	1	0	0	0	1	0	0	1
11	10	0	1	0	0	0	1	0	1	0	1	0	0	1
12	11	0	0	1	0	1	0	1	0	0	0	1	0	1
13	12	0	0	0	1	0	1	1	0	0	0	1	0	1
14	13	1	0	0	0	0	0	1	0	1	0	1	1	1
15	14	0	1	0	0	1	0	0	0	1	0	0	0	0
16	15	0	0	1	0	0	0	1	0	0	1	1	0	0
17	16	0	0	0	1	0	1	1	0	0	0	0	1	0
18	17	1	0	0	0	1	0	0	1	0	1	1	1	1
19	18	0	1	0	0	1	0	0	1	0	0	0	0	0
20	19	0	0	1	0	0	0	1	0	1	0	1	0	0
21	20	0	0	1	1	1	0	0	0	1	0	0	1	0

Figure 3. Tutorial type, gender, experience, and task categorical values have been formatted as dichotomous variables.

This lesson can be tweaked to accommodate alternative software. Open source alternatives to Excel include Gnumeric (for Windows) and OpenOffice Calc (for Mac and Linux). GNU PSPP is an open source alternative to PASW.



Run descriptive statistics

Run descriptive (summary) statistics on the dataset and output results in a new spreadsheet. If necessary, rearrange columns so that data requiring summary, those with **continuous** values, are adjacent. (In the spreadsheet, the continuous values of *perc_enjoy*, *perc_usefulness*, and *perc_ease_of_use* are already adjacent.)

Write down the "input range" (i.e. H2:J26) of the data requiring summary, making sure not to include variable labels.

Analyzing descriptive statistics may lead you to ask new questions. For example, *perc_enjoy* is much higher on average than *perc_usefulness*, which also has a large variance. This suggests that a segment of users may not have considered the system useful even though they enjoyed using it.

It may be helpful to review the definition and uses of the common descriptive statistics provided in the Excel output.

1. Go to **Tools > Add-Ins...** and make sure **Analysis ToolPak** is checked. Click OK.
2. Go to **Tools > Data Analysis** and select **Descriptive Statistics**. Click OK.
3. Enter the input range in the blank and check **Summary Statistics**. Click OK.

The descriptive statistics summary will output in a new sheet. Rename this spreadsheet *Descriptive_Stats*. Label the output according to the variables. For example, *Column 1* should be *perc_enjoy*. Your *Descriptive_Stats* spreadsheet should now look like Figure 4.

Analyzing descriptive statistics is a great way to start appraising a dataset before running inferential statistics. What insights about the dataset can you glean from the summary statistics for *perc_usefulness* and *perc_ease_of_use*?

	A	B	C	D	E	F
1	<i>perc_enjoy</i>		<i>perc_usefulness</i>		<i>perc_ease_of_use</i>	
2						
3	Mean	0.8425	Mean	0.695	Mean	0.7325
4	Standard Error	0.015360257	Standard Error	0.018157299	Standard Error	0.019270552
5	Median	0.8125	Median	0.6875	Median	0.75
6	Mode	0.8125	Mode	0.75	Mode	0.75
7	Standard Deviation	0.076801286	Standard Deviation	0.090786494	Standard Deviation	0.096352759
8	Sample Variance	0.005898437	Sample Variance	0.008242187	Sample Variance	0.009283854
9	Kurtosis	-0.48352709	Kurtosis	0.049690101	Kurtosis	-0.524786868
10	Skewness	0.123251578	Skewness	-0.048372982	Skewness	0.36418046
11	Range	0.3125	Range	0.375	Range	0.375
12	Minimum	0.6875	Minimum	0.5	Minimum	0.5625
13	Maximum	1	Maximum	0.875	Maximum	0.9375
14	Sum	21.0625	Sum	17.375	Sum	18.3125
15	Count	25	Count	25	Count	25
16						
17						
18						

Figure 4. Excel will not run descriptive statistics with non-numeric characters, so the variable labels must be re-entered.

Use pre-created examples of other dataset summary statistics to better illustrate the value of analyzing descriptive statistics for interesting patterns and trends.



Run inferential statistics

Open PASW and upload the spreadsheet. (IIT labs in Stuart Building, room 112, have PASW. You can also download a [30-day free trial](#).)

1. When PASW starts, it will prompt you for a data source. Select **Open an existing data source > More Files...**
2. Set the file type to Excel, then find and open the file.
3. From the list, select the Formatted_Data worksheet. Click OK. You should now see the dataset.

The most commonly used statistical methods and tests are found under the **Analyze** menu in the standard toolbar.

Figure 5 shows where to find some common statistical methods and tests. Under PASW's **Analyze** menu, see if you can also find the following:

1. Wilcoxon-Mann-Whitney test
2. Simple linear regression
3. Non-parametric correlation

It may be helpful to review the definition and uses of the common inferential statistics. Help students find them in the Analyze menu.

The screenshot shows the PASW Statistics Data Editor interface. The main window displays a data table with columns for user_ID, feature_focus, male, and female. The Analyze menu is open, showing various statistical options. Three specific sections are highlighted with red boxes:

- Chi-Square tests (under Crosstabs)**: Located under the Crosstabs option in the Descriptive Statistics section.
- T-tests, Analysis of Variance**: Located under the General Linear Model section.
- Pearson's Product Correlation Coefficient (under Bivariate)**: Located under the Correlate option in the Bivariate section.

Figure 5. Don't assume PASW doesn't run a given test. Many are located under broader statistical classifications.

Use your prior knowledge or the [Choosing the Correct Statistic](#) resource to determine which statistic to run to find whether there is a significant difference in *perc_usefulness* between *free_play* and other tutorial types.



Run inferential statistics, cont.

You should have determined that the Kruskal-Wallis one-way analysis of variance is the appropriate test.

Go to **Analyze > Nonparametric Tests > K**

Independent Samples... A new window will open prompting you to select the variables (by column name) to be tested.

Consult [UCLA's Choosing the Correct Statistic](#) to ensure the statistical analysis is appropriate for your research question(s), variables of interest, and associated data types.

1. Select the *perc_usefulness* variable from the scrollable list on the left, and click the top arrow to move it to the Test Variable List (i.e. dependent variable).
2. Select the *free_play* variable from the scrollable list, and click the bottom arrow to move it to the Grouping Variable section (i.e. independent variable).
3. Click **Define Range...**, and enter "0" in the Minimum field and "1" in the Maximum field. This specifies the two categorical variables to be tested. Your screen should now look like Figure 6. Click Continue.

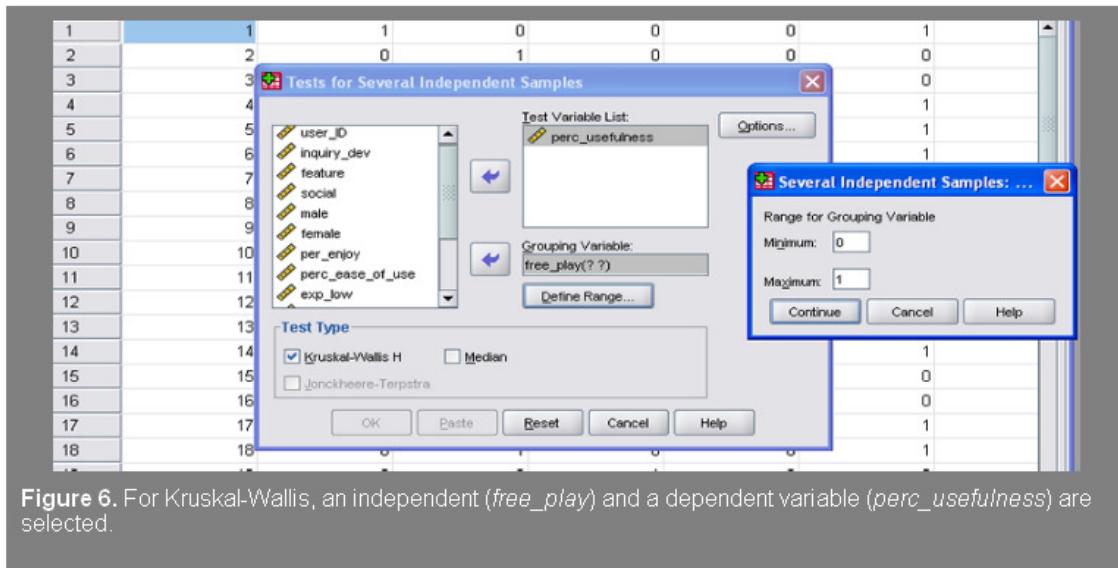


Figure 6. For Kruskal-Wallis, an independent (*free_play*) and a dependent variable (*perc_usefulness*) are selected.

Exercise:

Working in groups, have students come up with questions about the dataset, then find and run the appropriate inferential statistic using the Choosing the Correct Statistic resource.



Run inferential statistics, cont.

Click OK to display the statistical analysis results to new viewing window. Your results screen should look like Figure 7. Because statistical analysis output contains many numerical components (some of which must be cited in formal reports), it is a good idea to save it to a format independent of the PASW software. To save the results, go to **File > Export**. Change Document Type to the desired output format (Word, Excel, PDF, etc.), then click OK.

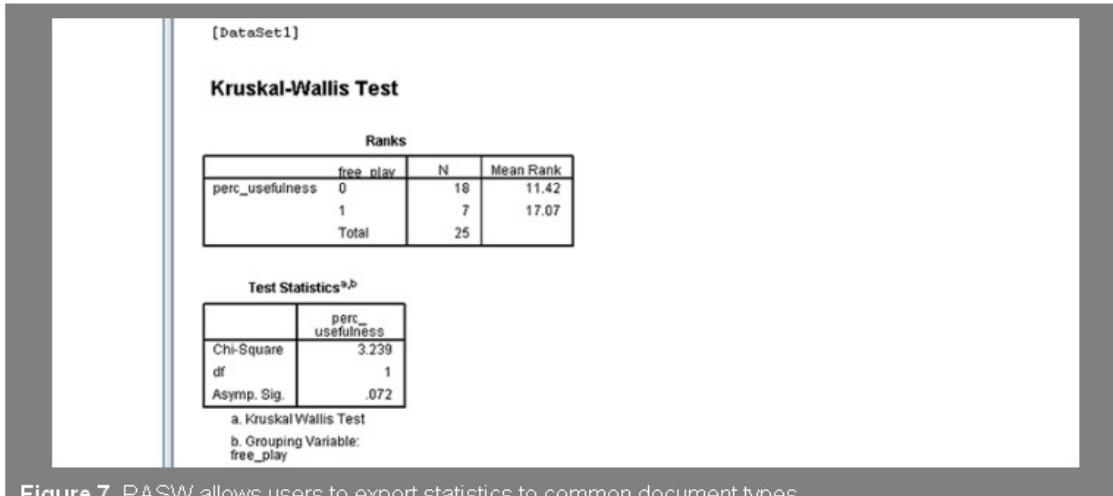


Figure 7. PASW allows users to export statistics to common document types.

Test your knowledge

Now that you've finished the lesson, please complete a short quiz to test your understanding of formatting research datasets for comprehensive statistical analysis.

[Take the quiz!](#)

You can find an accurate and thorough reference on reporting statistics in research papers in APA style at <http://depts.washington.edu/psywc/handouts/pdf/stats.pdf>.



Research data organization and analysis quiz

Instructions: Based on the best practices and concepts described in the previous lesson, read each question and select the best option.

1. Which is the best way to format the image_size variable value?

- width_by_height, 8 x 4
- image_area, 32
- image_width, 8; image_height, 4

2. What is a unique identifier?

- A variable used to differentiate among the different subjects or items in the study
- A fixed characteristic of the subjects or items in the study
- A variable that is expected to change due to the manipulation of an independent variable

3. How should the Education Level variable be formatted for PASW?

ID	High_school	Bachelors	Masters	Doctoral
1	0	0	0	1
2	0	1	0	0
3	0	1	0	0

ID	Education_level
1	doctoral
2	bachelors
3	bachelors

ID	Education_level
1	4
2	2
3	2

4. Which columns should be selected for running Excel descriptive statistics?

- Sex, Age, Task_Time, Occupation
- IQ, Age, Task_Time, Test_Score
- Interface_Type, Task_Time, Age, Test_Score

5. How should you record your statistical analysis output in PASW?

- Copy and paste into a Word document
- Re-type important values into a Word document
- Export to a Word document



Managing References

The purpose of this lesson is to present graduate students with a useful tool, Zotero, that will enable them to easily manage their references while working on their research paper.

In this lesson, students will learn:

- Why managing references is important
- What Zotero is
- Why Zotero is useful
- How to use Zotero to organize and cite sources in a Word and LaTeX document



Why is managing references important?

References are one of the most essential facets of a research paper because they indicate the source of your information and acknowledge another's work. Failure to cite references or cite them appropriately is considered plagiarism.

Managing your references can help you to cite your sources correctly and avoid plagiarism. In addition, it can help you to:

- Organize your sources
- Keep consistent and accurate records
- Keep track of your sources
- Refer back to your sources easily (if needed)
- Choose the most relevant sources
- Keep from over using sources

Although managing references carry many benefits, it is not easily done manually. This is why reference management software such as Zotero is useful.

In this section,
you may want to
emphasize the
consequences of
plagiarism.



Zotero

What is Zotero?

Zotero is an open-source reference management software. It is an extension for FireFox, therefore making it compatible with any platform using Firefox. In addition, Zotero can be used on a PC or a Mac computer.

Why use Zotero?

Zotero helps you to collect, organize, and easily cite your sources. With Zotero, you can easily extract items from places such as library catalogs and many websites and neatly store those items in a central location on the Zotero. In addition, you can import and export your bibliographies in various formats, including BibTeX, which you will be shown how to do later in this lesson. You can incorporate your sources from Zotero into several types of documents including Microsoft Word and LaTeX.

There are several other reference management software that you can use as well such as BibDesk and RefWorks. However, Zotero is free, easy to install and use, and compatible for both PC and Mac computers.

How do you use Zotero?

To follow this tutorial, you will need to three things:

- Firefox browser
- Zotero 2.0 installation
- Words for Window plugin 3.0a3

To install Zotero, you can go to <http://www.zotero.org> and click on the red download button located at the upper right hand corner of the website. To install Words for Window plugin, you can go to http://www.zotero.org/support/word_processor_plugin_installation. You will need to use Firefox to install Zotero and its accompanying plugin.

Here, you could offer assistance to your students to assure that they are able to successfully install the needed equipment.

Once you have installed Zotero, you can access it by going to Tools in the upper toolbar on the internet, and clicking Zotero. To close Zotero, you would follow the same procedure you used to open it.

What can you do with Zotero?

There are a variety of things that you can do with zotero. In this lesson, you will learn how to:

- Add sources to Zotero
- Save websites as sources with snapshots
- Organize your sources
- Cite sources
- Create BibTeX file
- Export files

Adding sources to Zotero

You can add different sources (i.e. journals, books, articles) to your Zotero collection. There are a variety of ways that you can add these sources to your collection. You can add sources by:

- Automatically extracting source information from websites
- Importing files from different databases
- Manually adding source information



What can you do with Zotero, cont.

Extracting source information from websites

You can extract source information about items such as books and journal articles from a variety of places on the web including library catalogs, websites such as amazon and the like. There are many websites that are compatible with Zotero. Here is a link to these websites. [Compatible websites](#)

To automatically extract information from the web, you would go to the website of your choice, and then to the source that you want to extract information about, and click on the icon located on the upper right hand corner of the web browser next to the star. Upon clicking the icon, the details of your book, journal, article etc. will automatically populate into each of the three Zotero columns.

In giving your students the processes for completing these tasks, you may additionally wish to have them actually perform the different operations in Zotero. Don't allow them to proceed to the next section until they have successfully completed the tasks from the current section. In addition, you may want to show your students what the final product would look like if they have gone through the tasks successfully. This method of instruction could help assure that your students fully understand how to use Zotero.

Importing citation files

Another way to add sources to your Zotero collection is by importing citation files. You can import citation files from library catalogs.

To import citation files to your Zotero collection, you would go to the library catalog of your choice. You would then type in the article, journal, whose citation you wish to extract. Click on the article, journal, book link. Click on the "Save Record" icon on the page. A box entitled, "Records will be saved on your PC or Mac" will appear. You will then have the option to choose the "Record Format" of your choice. You would need to choose a format that is compatible with Zotero. Zotero supports the following formats:

- MODS (Metadata Object Description Schema)
- BibTeX
- RIS
- Refer/BibTeX
- Unqualified Dublin Core RDF
- Zotero RDF

After choosing a format, you will be given the option to open or save the citation. You would save the citation. You would then go to your Zotero page and click on "Import" from the "Actions" icon. You file options will open and you would choose the citation file that you just saved and click OK. Your citation will populate in your Zotero collection.

Manually adding source information

An additional way that you can add sources to your Zotero collection is by adding source information manually. To add source information manually, you would click on the "New Item" icon in Zotero. You would then select the source type (i.e. journal, article, book) that you want to add. After selecting your source type, you would then enter the details of the source on the left column of Zotero.



What can you do with Zotero, cont.

Saving websites as sources with snapshots

Another attribute of Zotero is that you are able to save actual websites to your Zotero collection with accompanying snapshots. To do this, you would go to the website of your choice. On Zotero, you would click on the "Create New Item From Current Page" icon. Your website will automatically save to your Zotero collection. To add a snapshot of your website, you would click the "View Snapshot" button on the left hand column of the Zotero screen.

Organizing your sources

To organize your sources in Zotero, you would click on the "New Collection" icon located at the upper left hand corner of the screen. In the box that populates, you would type in the name of the folder that you want to create and Zotero will create the folder for you. To move sources to that folder, you would just click on the source of your choice from the middle column of the Zotero screen, and drag it into the folder. You can place as many or few sources in that folder as you choose. In addition, you can create as many folders as you want and store specific sources there.

In giving your students the processes for completing these tasks, you may additionally wish to have them actually perform the different operations in Zotero. Don't allow them to proceed to the next section until they have successfully completed the tasks from the current section. In addition, you may want to show your students what the final product would look like if they have gone through the tasks successfully. This method of instruction could help assure that your students fully understand how to use Zotero.

Citing sources in Microsoft Word

With Zotero, you can easily incorporate your citations into a variety of places including your email, blogs and paper documents. To incorporate your citations into places such as your email, blogs, forums, and other mediums, you would simply click and drag the citation into that medium. However, incorporating citations into a paper document on desktop publishing systems such as Microsoft Word has a different process. You would first need to install the Words for Window plugin 3.0a3 that accompanies Zotero. You would then click on Add-Ins located in the toolbar in Microsoft Word. You would then click on the Zotero Set Doc Preferences icon which is the second to the last icon under Add-Ins. Under this section, you can choose the style of your chose for your citation. After choosing your citation style, you would click on the Zotero Insert Citation icon located on the left hand corner of the screen and select the source that you want to cite. You also have the option to cite several sources at once by clicking on Multiple Sources at the bottom of the screen. In addition, you can indicate the page number of your citation(s) in the lower right hand corner of the screen. Click ok and your citation will appear in your document.

To include a bibliography of the sources that you cited, you would click the Zotero Insert Bibliography icon in the Custom Toolbars.



What can you do with Zotero, cont.

Creating a BibTeX file

BibTeX is a great formatting style for bibliographies and is primarily used in conjunction with LaTeX, which you will learn about in the Layout tutorial. However, you can also incorporate BibTeX files into TeX and HTML documents. To create a BibTeX file, you would select BibTeX from the Export Library list. You will then be given the option to save your document in BibTeX. Your document would end in .bib. To see your reference formatted in BibTeX, you would go to File in the toolbar above, select Open File, then select the .bib file that you saved.

Note: You will learn later how to incorporate your BibTeX files into a LaTeX document.

Exporting citation files

Zotero allows you to export the files from your collection. In exporting files, you can incorporate your citations and/or bibliographies into your research paper. To learn how to incorporate your Zotero citations/bibliographies into a LaTeX document, refer to the [Layout](#).

To export files, you would go the Actions icon and select Export Library. This will cause you to export all of the sources in your Zotero collection. However, to export only a selected item, you would right click the item of your chose in the middle column and select Export Selected Item.

Testing Your Knowledge

Now that you have gone through the tutorial, it's time to test your knowledge!

Exercise

Obtain a research paper that you have done in the past. Using the knowledge that you have acquired from this tutorial, you will manage your references from your paper using Zotero. In managing your references from that paper, you will:

- Add and organize five of your references using Zotero
- Incorporate at least two citations into your document using the appropriate citation style required for your paper
- Find and import other relevant(to your paper) citations into your Zotero collection

In addition, recall how to do the following without using the tutorial:

- Create a citation file
- Create a BibTeX file
- Export a file

Here, you could re-emphasize not using the tutorial for the given exercise. To assure that they are not using the tutorial, you can go around the class and check their computers as they work.

If you complete these tasks, you have successfully mastered the basics for managing your references in Zotero!



Style Guides

This lesson is intended for Technical Communication graduate students who are unfamiliar with the different types and usages of style guides. As a Technical Communication graduate student, it is imperative that you understand when to use the appropriate style guide, especially when writing a manuscript for submission to a scholarly journal. This lesson will also include a brief summary of what kind of information a style guide offers, as well as how to use a style guide to create clear, consistent, scholarly, and professional documents.

In this introduction, we will give a definition of style guides and offer some helpful websites in which you can access the *Chicago Manual of Style* and *The Publication Manual of the American Psychological Association*. We will focus on these two style guides later in the lesson. We recommend that you purchase and familiarize yourself with both these style guides if you plan on writing and submitting a manuscript to a scholarly journal sometime in your academic career.



What is a Style Guide?

If you have ever written a formal research paper, then you know that certain guidelines must be followed to maintain uniformity in style and formatting throughout your paper. When designing and writing documents, a style guide is a reference to the set of standards that must be followed, either for general use or for a specific publication or organization, in order to maintain that uniformity and ensure standardized usage and conventions. There are several different types of style guides depending on the discipline, but, for our purposes, we will address the style guides used most frequently in academia, including.

For a comprehensive list of professional and academic style guides, and where they are used most frequently, [click here](#).

- *The Modern Language Association Style Handbook*, or MLA, used for subjects in the arts and humanities.
- *The Publication Manual of the American Psychological Association*, or APA, used for the social sciences
- *The Chicago Manual of Style*, used for book and journal publications. It is closely related to the *Turabian style*, used for term papers, theses, and dissertations.

MLA is probably the first style guide that you were taught to use in high school and as an undergraduate student. In graduate school, it is generally replaced by *The Chicago Manual of Style*, which we will frequently refer to as CMS in this lesson, or *The Publication Manual of the American Psychological Association*, which we will refer to as APA.



The Chicago Manual of Style Login Page. This is what you should see when you get to step 3.

How to Access Style Guides

Most style guides can be obtained in print-form from any bookstore or at your local library. However, some can also be accessed online.

- The Purdue Owl website is an excellent resource for MLA and APA guides. This website is free for any user and can be accessed [here](#)
- The *Chicago Manual of Style* can be accessed in full [here](#)
- In order to access the CMS, you must either pay for a subscription or sign up for a free one month trial. Click on the link above to get started.

1. After you access the website, click the link that says **FREE TRIAL**. Fill in the required information, and click **Continue**

2. Once the information is submitted, you will be sent an email confirmation. Access your email account, and follow the instructions. You will be required to follow a link within the email to confirm your free trial.

3. The link will bring you to a sign-in page. Fill in your username and password that you just created and submit. You can now access the entire Chicago Manual of Style for free for the next 30 days.

In the next few sections, we will guide you through some scenarios of use within CMS and APA. If you do not own either style guide in print form, then we recommend that you access these websites and follow along with the instructions in order to get a better idea of how information is represented in these style guides.

Instruct students to follow the link to the Chicago Manual of Style website and help them set up their account. After their account is set up, encourage students to take 5-10 minutes to browse the website, especially the actual content of the style manual.



Scholarly Journal Manuscript Submissions

As a Technical Communication graduate student, you may find that you have written a research paper that you would like to submit to a scholarly journal for publication. One of the characteristics of a good manuscript is having minimal to no flaws in your writing and editorial style. Reviewers of your manuscript expect your editorial style, or the mechanics of convention laid out in the style guide, also referred to as a publication manual, to be perfect. The style guide is the final arbiter for abbreviations, preparation of tables and figures, references and in-text citations, and so forth.

Every scholarly journal has different authorities regarding editorial style. The following list outlines the top five Technical Communication journals and the style guides of which they require use for manuscript submissions:

The Top Five Technical Communication Journals

1. *Technical Communication*- on punctuation, format, and citation style, *The Chicago Manual of Style*, 15th edition.
2. *Journal of Business and Technical Communication*- on documentation, *Publication Manual of the American Psychological Association*, 5th edition, or APA. For other matters of style, and in-house manual is referred to and can be viewed [here](#).
3. *Technical Communication Quarterly*- on documentation and all matters of style, *Publication Manual of the American Psychological Association*, 5th edition, or APA.
4. *Journal of Technical Writing and Communication*- on documentation and all matters of style, an in-house manual that can be viewed [here](#).
5. *IEEE Transactions in Professional Communication*- on documentation and all matters of style, an in-house manual that can be viewed [here](#).

As you may already know, in order to access most scholarly journals, an annual membership fee is required. Your school should subscribe to most of them. Check out your campus library to find out which journals you can access for free.

Instruct students to refer to the “Finding a Topic” lesson for links to the TC journal websites if they would like to get more detailed information on Author Guidelines.

Scholarly journals like these need style guidelines in order to keep down the high costs of reviewing and editing, as well as to minimize communication problems. In order to get the most out of a style guide, we recommend taking the time to read the entire piece. However, style guides are often very lengthy, and sometimes reading it from cover to cover can seem a bit daunting. Therefore, in the next section, we will include a brief summary of all the chapters of both APA and CMS.



What Type of Information can be Found in a Style Guide?

As previously stated, style guides offer a plethora of information that are helpful to a writer when he or she encounters questions regarding style and formatting in their research paper. Its structure often takes the reader through the full manuscript preparation process, from discussion of the initial conceptualization of the research problem to what transpires during publication.

In this section, we include a brief summary of all the chapter topics of both CMS and APA.

CMS Table of Contents

1. The Parts of a Published Work
2. Manuscript Preparation and Manuscript Editing
3. Proofs
4. Rights and Permissions
5. Grammar and Usage
6. Punctuation
7. Spelling, Treatment of Words, and Compounds
8. Names and Terms
9. Numbers
10. Foreign Languages
11. Quotations and Dialogue
12. Illustrations and Captions
13. Tables
14. Mathematics in Type
15. Abbreviations
16. Documentation I: Basic Patterns
17. Documentation II: Specific Content
18. Indexes

Ask students if they have any questions on what each of the chapter topics mean. Most are self-explanatory, but explain each topic as needed; refer to the CMS website Table of Contents for further explanation.

If you are unfamiliar with the definition of any of these topics, you may want to access the Chicago Manual of Style website (see directions in Introduction) and skim the "overview" of each just to become a bit more familiar with their meaning.



What Type of Information can be Found in a Style Guide?, cont.

APA Table of Contents

1. Content and Organization of a Manuscript- describes a number of considerations authors should consider before beginning to write. Includes design defects that should be avoided and an overview of the various parts of a manuscript.
2. Expression of Ideas- emphasizes the significance of good writing and provides an overview of the usage of correct grammar. Also includes guidelines for the usage of unbiased language.
3. APA Editorial Style- includes detailed descriptions of numerous mechanical features of APA editorial style, including points on spelling, punctuation, abbreviations, table construction, etc.
4. Reference List- describes APA style for references and how to construct an accurate and complete reference list.
5. Manuscript Preparation and Sample Papers to be Submitted for Publication- describes mechanical instructions for the preparation of a manuscript, including examples.
6. Material Other than Journal Articles- describes differences between student papers and manuscripts submitted for journal publication.
7. Manuscript Acceptance and Production- outlines the procedures for submitting a manuscript and the subsequent handling of edited manuscripts if accepted by the journal.
8. Journals Program of the American Psychological Association- discusses the policies that govern APA journals and how editors work.
9. Bibliography- gives historical background, sources cited, and an annotated list of suggested readings.

Up to date changes in APA style can be viewed at the following website: [APA Style](#)



Documentation and Citation Examples in CMS and APA

In this section, we will give examples from both CMS and APA on how to represent in-text citations and how to document sources in a Bibliography or Works Cited page.

CMS Documentation and In-text Citation Examples

A common question students encounter when writing research papers is how to cite their resources both in-text and out. The Chicago Manual of Style illustrates two ways to cite material:

1. Notes and Bibliography
2. The Author-Date System

Please note: For this section, be sure to have completed the steps in the Introduction page of this lesson regarding how to access your free trial of the Chicago Manual of Style. You will want to follow along with the website in the next section to get a good idea of how the website looks and functions.

Both systems are acceptable; it just depends on the preference of your instructor or the scholarly journal to which you are submitting your manuscript. If your instructor has no preference, then it is entirely up to you! To learn more about the two methods, follow these steps:

1. Return to the **Table of Contents** page.
2. Click on the 16th topic titled **Documentation I: Basic Patterns**.
3. Skim through the first few topics. Sections **16.3** and **16.4** give a brief overview on the two different documentation systems. You may want to read these sections first to get an idea of what system you may want to use. They also provide brief examples of how the written citations look, both in-text and out.
4. Be sure to check out section **16.10**. It provides written examples of both systems, and it also provides a "Key" that identifies all the examples of documentation in the following sections. The key is represented as follows:
 1. N = Note
 2. B = Bibliography
 3. T = Parenthetical Text Citations (in Author-Date style)
 4. R = Reference list (in Author-Date style)



CMS Documentation and In-text Citation Examples, cont.

The screenshot shows the 'Table of Contents' for Chapter 16. The main title is '16 : Documentation I: Basic Patterns'. Below it is a list of topics:

- Introduction
 - 16.1 Two basic systems
 - 16.2 The essentials
 - 16.3 Notes and bibliography: overview
 - 16.4 The author-date system: overview
 - 16.5 Other systems
 - 16.6 Numbered references
 - 16.7 Flexibility
- Source Citation: Basic Elements, Different Formats
 - 16.8 Overview
 - 16.9 Common elements
 - 16.10 Examples
 - 16.11 Authors' names
 - 16.12 Year of publication
 - 16.13 Page numbers
 - 16.14 Locators for unpaginated electronic sources
 - 16.15 Punctuation
 - 16.16 Font
 - 16.17 Capitalization
 - 16.18 Styling electronic source titles
- Notes
 - 16.19 Footnotes versus endnotes in printed works
 - 16.20 Creating notes
 - 16.21 Footnotes: virtues

Chicago Manual of Style Documentation I: Basic Documentation Index.

After you get an idea of the two systems and decide which one you want or need to use, you will need to know how to document specific types of resources. Let's say you've decided to use the Notes and Bibliography system, and you want to know how to document a journal article. To access this information, you will need to do the following:

1. Return to the **Table of Contents** page.
2. Click on the 17th topic titled **Documentation II: Specific Content**.
3. Scroll down until you find section 17.148 titled **Periodicals**.
4. You may want to read through the entire section on periodicals, but you will find that in section 17.149, a list of the required information in a bibliographic citation is provided. The list reads as follows:
 - Author's or authors' name(s)
 - Title and subtitle of article or column
 - Title of periodical
 - Issue information (volume, issue number, date, etc.)
 - Page reference (where appropriate)
 - For online periodicals, a URL
5. Now that you know exactly what information you will need for your citations, continue reading the examples labeled N, for notes, and B, for bibliography to find out how to document specific elements of a citation.

Give students further practice with documentation by giving them other examples of sources that they may encounter, i.e. books with more than one author, journal articles that were found online, etc. Have them refer to the CMS and APA websites to seek information on the correct order of documentation information for types of research with which they have been instructed to practice.



Depending on your journal article, your bibliography entry will look something like this:

Morris, Romma Heillig. "Woman as Shaman: Reclaiming the Power to Heal." *Women's Studies: An Interdisciplinary Journal* 24 (September 1995): 573-84.

It should be noted that if your entry runs into a second line, then the second line must be indented, also known as a "hanging indent." Additionally, your bibliographic page must be put in alphabetical order according to the authors' last names. All this information can be accessed in the style guide.

For the same article, if your paper does not have a full bibliography, your in-text note would look like this:

1. Morris, Romma Heillig. "Woman as Shaman: Reclaiming the Power to Heal." *Women's Studies: An Interdisciplinary Journal* 24 (September 1995): 573.

It should be noted that, unlike the bibliography entry, the indentation for an in-text note should be put in front of the first line and not the second line. Also, notes are represented at the bottom of each page (footnotes) on which the article is mentioned. The number in front of the entry corresponds to the superscript note number that was placed within the text after the article is quoted or paraphrased.

APA Documentation and In-text Examples

APA citations consist of in-text citations as well as a Reference List that must be included at the end of your research paper. An excellent tutorial on the basics of APA style can be accessed [here](#). Simply hover your mouse over the second tab entitled "Learning APA Style"

The screenshot shows a web page titled "Basics of APA Style Tutorial". At the top, there is a navigation bar with links for "APASyle.org", "Resources", and "Exit". On the right side of the navigation bar, it says "15 of 25". Below the navigation bar, the main content is titled "Citing References in Text". A caption below the title states: "The following chart shows how to format in-text citations (6.11–6.15)". A table titled "Table 6.1 Basic Citation Styles" is displayed. The table has five columns: "Type of citation", "First citation in text", "Subsequent citations in text", "Parenthetical format, first citation in text", and "Parenthetical format, subsequent citations in text". The table contains eight rows, each providing an example of how to cite a work based on the number of authors. The examples follow the APA 6th edition guidelines for in-text citations.

Type of citation	First citation in text	Subsequent citations in text	Parenthetical format, first citation in text	Parenthetical format, subsequent citations in text
One work by one author	Walker (2007)	Walker (2007)	(Walker, 2007)	(Walker, 2007)
One work by two authors	Walker and Allen (2004)	Walker and Allen (2004)	(Walker & Allen, 2004)	(Walker & Allen, 2004)
One work by three authors	Bradley, Ramirez, and Soo (1999)	Bradley et al. (1999)	(Bradley, Ramirez, & Soo, 1999)	(Bradley et al., 1999)
One work by four authors	Bradley, Ramirez, Soo, and Welsh (2006)	Bradley et al. (2006)	(Bradley, Ramirez, Soo, & Welsh, 2006)	(Bradley et al., 2006)
One work by five authors	Walker, Allen, Bradley, Ramirez, and Soo (2008)	Walker et al. (2008)	(Walker, Allen, Bradley, Ramirez, & Soo, 2008)	(Walker et al., 2008)
One work by six or more authors	Wasserstein et al. (2005)	Wasserstein et al. (2005)	(Wasserstein et al., 2005)	(Wasserstein et al., 2005)
Groups (readily identified through abbreviation) as authors	National Institute of Mental Health (NIMH, 2003)	NIMH (2003)	(National Institute of Mental Health [NIMH], 2003)	(NIMH, 2003)
Groups (no abbreviation) as authors	University of Pittsburgh (2005)	University of Pittsburgh (2005)	(University of Pittsburgh, 2005)	(University of Pittsburgh, 2005)

This is an example of what a basic in-text citation in APA style should look like.



APA Documentation and In-text Citation Examples, cont.

We will give you a brief description of how in-text citations are handled, then we will address the mechanics of the Reference List. Here are a few points to remember regarding in-text citation in APA style:

- APA emphasizes the importance of the year of publication, which comes immediately after the author's name. For example, an in-text citation of a book with one author would look like this: (Mandelbaum, 2002)
- APA's reasoning behind this structure is because it is important to know whether the research was conducted recently and whether it came before or after other research as scholarship cumulates in the sciences and social sciences.
- If the author's name has already been mentioned in the sentence, then the citation omits it. For example, "Mandelbaum (2002) offers data concerning..." (Insert screenshot titled apa-intext here)
- Pagination is not included for in-text references, except for direct quotes
- Source documentation in the Reference page contain the following components: author name or names, publication date, title of the work, and publication data.
- All entries are arranged in alphabetical order by author's last name.
- All entries for a single author are arranged by year of publication, beginning with the earliest. If there were two entries for a particular year, say 2002, they would be alphabetized by title and the first would be labeled (2002a) and the second (2002b).
- APA's rules for capitalizing book and article titles are the same as the rules for capitalizing sentences: only the first word is capitalized. Proper nouns are always capitalized, and if there is a colon in the title, the first word after the colon is also capitalized.
- Single author entries precede those with co-authors.
- Multiple authors are joined by an ampersand "&" and not the word "and."
- The author's first names are always reduced to initials.

The APA Reference List basic guidelines are also outlined in the tutorial mentioned above. Here is a link to an [example of a Reference Page in APA style](#).

The screenshot shows a web-based tutorial for APA Style. At the top, the logo 'APA Style' is displayed with a blue stylized 'A'. Below it, the title 'Basics of APA Style Tutorial' is shown. A green navigation bar at the top right includes links for 'APASTyle.org', 'Resources', and 'Exit', along with a page indicator '◀ 18 of 25 ▶'. The main content area is titled 'The Reference List'. It contains text about the components of references and a diagram illustrating the structure of a reference entry. The entry is as follows:

Mikulincer, M., Gerber, H., & Weisenberg, M. (1990). Judgment of control and depression: The role of self-esteem threat and self-focused attention. <i>Cognitive Therapy and Research, 14</i> , 589–608.	Author names	Publication date
Title of work		Publication data

Annotations with arrows point from the text labels 'Author names', 'Publication date', 'Title of work', and 'Publication data' to the corresponding parts of the reference entry.



Test Your Knowledge

Now that you have read through the directions on documentation in both CMS and APA, please take a moment to test what you have learned by completing this short task.

CMS and APA Documentation Task

The following pieces of information make up a journal article. They are in random order. Following the CMS guidelines for the Notes and Bibliography system, put the pieces of information in the correct order as they would be represented on the Bibliography page. Do the same using the APA guidelines for documentation as it would appear in the Reference List:

1. Author- Nicholas A. Palomares
2. Title of periodical- *Human Communication Research*
3. Issue number- 30
4. Title of article- "Gender Schematicity, Gender Identity Salience, and Gender-Linked Language Use"
5. Issue date- October 2004
6. Page numbers- 556-588

Answer for CMS:

Palomares, Nicholas A., “Gender Schematicity, Gender Identity Salience, and Gender-Linked Language Use.” *Human Communication Research* 30 (October 2004): 556-88.

Answer for APA:

Palomares, N.A. (2004, October). Gender schematicity, gender identity salience, and gender-linked language use. *Human Communication Research*, 30, 556-88.



Layout & Formatting with LATEX

In this lesson, we'll introduce you to LATEX, a tool that you can use to give your research paper a polished academic look without spending a lot of time on layout. You will find out more about what LATEX is, what its benefits are and of course how it works. At the end of this lesson, you will be able to create a professionally formatted and structured document with LATEX.



What is LATEX?

What kind of technology is LATEX?

LATEX is an open source document markup language that is used to create documents that can be processed by the typesetting tool TeX.

How does LATEX work?

Since LATEX is a markup language, it uses plain text commands to define the formatting and layout of a document, similar to the way HTML/CSS does for webpages. Like HTML/CSS needs to be processed by a browser, LATEX needs TeX to produce a readable output. TeX formats the input text according to the LATEX commands and produces output documents in PDF and DVI (for screens).

Why use LATEX?

What's the difference between LATEX and a word processor?

The most obvious difference between LATEX and a word processor (such as Microsoft Word) is that you won't be able to see right away what your document will look like; you have to generate an output document first.

In order to be able to create a LATEX document, you need to be familiar with the use of LATEX commands. Some editors offer graphic user interfaces mimicking a word processor to facilitate editing for beginners, but they usually do not offer the full range of commands available in LATEX.

There are also certain limitations to how much you can control the look of your document. The basic LATEX document types (called document classes) come with a built-in style with a limited number of options to choose from. You could of course write your own style, but that takes a considerable amount of time and programming knowledge.

Show on-screen and printed versions of documents produced with LaTeX and MS Word and let students compare the results.

What are the advantages of using LATEX?

First of all, LATEX is a free open source product that is well documented on the web and is platform independent. Documents can be shared without versioning issues and will look exactly the same on every computer.

When you are working with LATEX, you can be sure that you will have a document with consistent formatting and layout without giving it a second thought. It is almost impossible to accidentally change styles or move elements like images without intending to do so. Without worrying about the appearance of your document, you can concentrate on its logical structure and content.

It is also very simple to add structural elements like footnotes, quotes, tables of contents and other indices. You can use BibTeX (comes with your LATEX installation) to insert citations into your document and automatically create a bibliography with a single command.

One of the reasons LATEX is widely used in academia is its unique ability to display even the most complicated mathematical formulae in a beautiful and correct way.

LATEX is useful whenever you

want to create a document that

- needs to be formatted professionally
- has a complex internal structure
- contains mathematical formulae
- you collaborate on with others



What kind of software do I need to run LATEX?

To be able to work with LATEX, you need two things:

1. An editor to create your documents
2. A \TeX installation with LATEX integration to process your documents and export them to .pdf

Work online

For this tutorial, we will use [ScribTeX](#), a web application that provides both components. You can either sign up for ScribTeX in order to be able to store your documents online, or use the [ScribTeX](#) sandbox, a public repository that allows unregistered users to create and edit LATEX documents on the fly.

If you prefer to install \TeX on your own computer you can use the following resources:

On a PC

- < a href="http://wwwxm1math.net/texmaker">Texmaker (free cross-platform LATEX editor)
- [MiKTeX](#) (open source \TeX distribution, also available in a < a href="http://miktex.org/portable/about">portable version to run on a flash drive)

On a Mac

- [MacTeX](#) (open source \TeX distribution, open source editor [TeXShop](#) is included)

If students want to use a local installation on their own laptops in class, make sure they install the required software in advance.

How do LATEX commands work?

LATEX commands are used to define the structure and formatting of your document.

The syntax of a command follows a specific order:

```
\commandname[optionalparameter]{requiredparameter}
```

The beginning of a command is indicated by a backslash, followed by the name of the command. Some commands require a parameter that is placed between curly braces after the command name.

In some cases, optional modifying parameters can be defined. Optional parameters are placed in square brackets between the command name and the required parameter and are separated by a comma.

The command used to specify a document of the type "article", set in two columns with 11 pt as the main font size looks like this:

```
\documentclass[11pt,twocolumn]{article}
```

3 things to remember about LATEX commands:

1. Commands are case sensitive
2. No space is allowed between the backslash and the command name
3. Command names consist of letters only
Exception: commands for special characters consist of a single non-letter character (e.g. \\$, &, %, _)

All the commands in this tutorial are available on a [cheat sheet](#) created by Winston Chang.



Layout & Formatting with LATEX

Now that you know how LATEX commands work, you are ready to create your first LATEX document and give it an internal structure.

How do I create a basic LATEX document?

It only takes two steps to create a basic LATEX document:

1. Define the class (=type) of document you want to create:

```
\documentclass{report}
```

There is a number of different document classes, the ones frequently used in academia are *article*, *report* and *book*. Each document class comes with a built-in set of formatting and structuring characteristics, much like a template, that match the purpose of the document (e.g., the type *book* is by default set as double sided with facing pages).

2. Add document content:

```
\documentclass{report}
\begin{document}
This is my first LaTeX document.
\end{document}
```

Make sure to save your LATEX document with the extension *.tex*.

Hands on

1. Go to the [ScribTeX sandbox](#) and create a new LATEX document.
(You have to scroll down to the bottom of the page.)
2. Create a book with a 12pt font size
3. Preview your document. It might take a couple of seconds to process.
4. Change the document class.
5. Preview your document. It might take a couple of seconds to process. Can you see any changes?

[View a sample solution.](#)

If students are using a local installation, remind them that they need to typeset the document before they can view it. ScribTeX does that automatically.

Find the sample solution for this exercise on page 57 of the instructor guide.



How do I structure my L^AT_EX document?

Parts, chapters and sections

Creating a document structure in L^AT_EX is very easy. If you want to begin a new structural unit, simply add the corresponding command with the unit heading in curly braces.

For example, if you want to begin a new chapter named "First Chapter" type:

```
\chapter{First Chapter}
```

L^AT_EX automatically takes care of numbering and formats the unit headings according to their place in the structural hierarchy. Here is a list of available structural units and their characteristics:

```
\part{part} (Roman numerals)  
\chapter{chapter} (decimal numbering, only books & reports)  
\section{section} (decimal numbering)  
\subsection{subsection} (decimal numbering)  
\subsubsection{subsubsection} (only numbered in articles)
```

If necessary, review conventions for section numbering in academic publications.

If you want to suppress the automatic numbering of a heading, simply add an asterisk to the command used to create it, right before the curly braces.

```
\section*(section)
```



How do I structure my LaTeX document, cont.

Spaces and breaks

LATEX treats any number of consecutive spaces as one single space. It doesn't matter if the spaces were created by using the space bar or the tab key, even a single line break (using the return key) is treated only as a space. If you want to add additional spaces, type a backslash before every additional space.

LATEX automatically breaks lines, so if you want to add a line break at a specific point in the text, you need to indicate that by adding two backslashes. To begin a new paragraph, simply add an empty line between two lines of text, to begin a new page, add the \newpage command.

```
\\\t\t\t\tBegin new line without new paragraph.  
empty line\t\tBegin new paragraph.  
\newpage\t\t\tBegin new page.
```

Hands on

1. Add two chapters to your book, along with three sections and as many subsections as you want.
2. Add some dummy text to your first section and divide it into paragraphs.

Preview your document after each step. It might take a couple of seconds to process.

[View a sample solution.](#)

Find the sample solution for this exercise
on page 57 of the instructor guide.



How do I format text?

Although one of the major purposes of L^AT_EX is to reduce manual formatting, sometimes it is necessary to emphasize a word or sequence of words. Most of the formatting options of a word processor can be used. Simply type the corresponding command and add the word(s) that should be formatted in curly braces:

```
\textbf{bold}           bold
\textit{italics}       italics
\underline{underlined} underlined
\sout{deleted}        deleted
```

Discuss different ways of emphasizing words and point out potential problems, e.g. underlined words being mistaken as hyperlinks.

Lists

To create a bulleted list, use the *itemize* environment and add each bullet point as a list item:

```
\begin{itemize}
  \item The first item
  \item The second item
  \item The third item
\end{itemize}
```

To create a numbered list instead, simply use *enumerate* instead of *itemize* in the environment commands.

L^AT_EX also allows nesting of lists. Begin a nested list below its parent item.

```
\begin{enumerate}
  \item The first item
    \begin{itemize}
      \item Item 1a
      \item Item 1b
    \end{itemize}
  \item The second item
  \item The third item
\end{enumerate}
```

Hands on

1. Add a numbered list to your first section.
2. Change the numbered list to bullet points.
3. Nest a numbered list within the bulleted list.

Preview your document after each step. It might take a couple of seconds to process.

[View a sample solution.](#)

Find the sample solution for this exercise on page 57 of the instructor guide.



How do I add and format images?

To be able to use images in your document, you need to activate the *graphicx* package. A package adds additional functions to a basic L^AT_EX document. In this case, it allows the use of images.

```
\usepackage{graphicx}
```

Discuss the role of different types of images and graphs in academic papers.

All *usepackage* commands have to occur at the beginning of your document after the *\documentclass* command, within the preamble (The preamble is everything before the *\begin{document}* command.)

To add an image, insert the *\includegraphics* command at the desired position in the text with the name of the image in curly braces. Do not include the image's file extension. (The image needs to be located in the same folder as your document.)

```
\includegraphics{imagename}
```

To change the size of the image, add the desired width in square brackets. You can either use the absolute width or specify the desired relation of the image size to the width of the text.

```
\includegraphics[width=2in]{imagename}  
(image will be scaled, not distorted)  
  
\includegraphics[width=0.75\textwidth]{imagename}  
(image width will be 75% of the text width)
```

Right now, the image is added directly in the text, without any spacing or alignment. To allow better placement and to be able to add a caption, the image needs to be placed in a *figure* environment:

```
\begin{figure}  
 \includegraphics[width=0.75\textwidth]{imagename}  
\end{figure}
```



How do I structure add and format images, cont.

Right now, the image is added directly in the text, without any spacing or alignment. To allow better placement and to be able to add a caption, the image needs to be placed in a *figure* environment:

```
\begin{figure}
\includegraphics[width=0.75\textwidth]{imagename}
\end{figure}
```

Now L^AT_EX automatically places the figure wherever there is enough space on the page. If there is no space, the figure might be moved to the next page. However, you are able to define a placement specifier to narrow down the placement of the figure (*t*= top of the page, *b*= bottom of the page, *p*= separate page for figures, *h*= approximately here). The placement specifier is added to the *figure* command in square brackets:

```
\begin{figure}[t]
\includegraphics[width=0.75\textwidth]{imagename}
\end{figure}
```

To add a caption to the figure, include the *\caption* command after the image (or before, if the caption should appear above the image) in the *figure* environment and add the caption text in curly braces:

```
\begin{figure}[t]
\includegraphics[width=0.75\textwidth]{imagename}
\caption{This is the caption for imagename}
\end{figure}
```

Discuss when it makes sense to use a separate page for figures.

Figures are numbered automatically, so there is no need to add a number to the caption.

Hands on

1. Upload an image file to the [ScribTeX sandbox](#) (You have to scroll down to the bottom of the page.).
You can also use any of the files that are already in there.
2. Add a figure after your first paragraph.
3. Change the position of the figure. Try a few options.
4. Add a caption to your figure.
5. Add another figure and move both figures to a separate page.

Preview your document after each step. It might take a couple of seconds to process.

[View a sample solution.](#)

Find the sample solution for this exercise on page 58 of the instructor guide.



Adding Citations in L^AT_EX

To manage references, insert citations and create bibliographies, L^AT_EX uses another markup language tool called BibTeX that comes with every L^AT_EX installation. A BibTeX entry contains all information about a source, such as author, title, year, etc. The entry for M. D. Merrill's article *A Task-Centered Instructional Strategy* looks like this:

```
@article{merrill_task-centered_2007,
Author = {M. David Merrill},
Journal = {Journal of Research on Technology in Education},
Number = {1},
Pages = {5-22},
Title = {A Task-Centered Instructional Strategy},
Volume = {40},
Year = {2007}
}
```

You don't have to manually type all this information. There's a number of reference management systems (e.g., BibDesk, Zotero) that will automatically output a BibTeX bibliography file (file extension .bib) that contains all the entries for the sources you're citing. To find out how to create a .bib file with Zotero, take a look at the [References](#) lesson.

Before you can start adding citations to your L^AT_EX document, you need to specify in which .bib file the source information is located. Simply add the following commands at the end of your document, right before the `\end{document}` command:

```
\bibliography{bibfilename}
\bibliographystyle{plain}
```

The first command indicates the name of the .bib file (without the .bib extension) and with the second command you specify the citation style you want to use. Learn more about different citation style options in the following section on [bibliographies](#).

Inserting citations

To insert a citation in your document, all you need is the source identifier of your reference, called citekey. You can find this citekey right at the beginning of the respective entry in your .bib file, between the opening curly brace and the first comma. The format of the citekey depends on the reference management software that created the .bib file. It can be a string of numbers and/or words. Citekeys generated by Zotero for example use the last name of the author, the first word of the title (other than an article) and the year (in case of the article above *merrill_task-centered_2007*).

Now you only need to insert a `\cite` command with the citekey in curly braces at the exact location in the text where the citation is supposed to occur. Some reference management systems (e.g., BibDesk) even allow to simply drag and drop the reference at the appropriate location in the text, but you can always add it manually.

Point out to students that .bib files can be easily shared with others (even across platforms) when working on a group project.



Inserting citations, cont.

```
The Pebble-in-the-Pond approach to instructional design  
\cite{merrill_task-centered_2007} is used here.
```

The output from the code above looks like this:

The Pebble-in-the-Pond approach to instructional design [1] is used here.

Numeric vs textual citations

Unless specified otherwise, L^AT_EX uses the numeric style of citation, meaning that every reference is numbered and the citation occurs as the corresponding number. If you prefer the citation in the author-year style in parentheses, you need to make a few adjustments.

1. Add the Natbib package to the preamble: `\usepackage{natbib}`
2. Use `\citet` instead of `\cite` commands for author-year in parentheses
(or `\citet` for textual citations without parentheses)
3. Change your bibliography style to a style compatible with the Natbib package:
`bibliographystyle{plainnat}`

```
\documentclass[11pt]{article}  
\usepackage{natbib}  
\begin{document}  
The Pebble-in-the-Pond approach to instructional design  
\citet{merrill_task-centered_2007} is used here.  
\bibliography{example}  
\bibliographystyle{plainnat}  
\end{document}
```

This will be the output then:

The Pebble-in-the-Pond approach to instructional design (Merrill, 2007) is used here.

If you're using the Natbib package, you can also choose if you want to list all authors in a reference with three or more authors or use the common *et al* version that is the standard in the Natbib package. To list all authors, simply add an asterisk to the citation.

```
\citet{*}{merrill_task-centered_2007}
```

To include the page number of your source, add it to the command in square brackets:

```
The Pebble-in-the-Pond approach to instructional design  
\cite[p. 33]{merrill_task-centered_2007} is used here.
```

If you want to cite multiple sources in the same place, i.e., within the same brackets, use a comma separated list:

```
The Pebble-in-the-Pond approach to instructional design  
\cite{merrill_task-centered_2007,burke_lessons_2007} is used  
here.
```



Adding a bibliography

Once you've added the `\bibliography` and `\bibliographystyle` commands to your document, a section with the heading "References" or "Bibliography" (depending on the document class used) is automatically created at the end of the document.

Whenever you insert a citation (with a command, that is), it will show up automatically in this bibliography, provided that the source information is included in the specified .bib file. This way, you can not overlook any references and the bibliography is always up to date.

Non-cited references

If you want to add references to your bibliography that are not cited in your document, you can use the `\nocite` command. The reference will be listed in the bibliography without a citation appearing in the text.

```
\nocite{merrill_task-centered_2007}
```

If you want all references listed in your .bib file to appear in the bibliography, for example for an annotated bibliography, use the open `\nocite{*}` command.

```
\nocite{*}
```

Bibliography and Citation Styles

It is very easy to change the formatting of your citations and bibliography. Once you change the bibliography style in the `\bibliographystyle` command, all formatting changes are made automatically. There's a number of built-in styles that come with \LaTeX , you can find an overview [here](#). You will also find lots of other BibTeX style files (.bst extension) online. In order to use a .bst file, you only need to copy it in the bst folder within your \LaTeX installation

A lot of bibliography styles are created after the style guides of academic journals. The style for IEEE transactions, `ieeetr`, is even one of the built-in styles.

Find more information about [bibliography management](#) in \LaTeX .

Hands on

1. Upload a .bib file to the [ScribTeX sandbox](#) (You have to scroll down to the bottom of the page.). You can also use this [example file](#) that contains information for two articles.
2. Specify which .bib file and which style you are using.
3. Add a citation for one of the articles.
4. Turn it into a citation in parentheses.
5. Add the second article without citing it.
6. Change the bibliography style a couple of times.

Find the sample solution for this exercise on page 59 of the instructor guide.

Preview your document after each step. It might take a couple of seconds to process.

If you are using your own \LaTeX installation, you need to take a few encoding steps until the citations appear: Use the `typeset` button 1x for \LaTeX , 1x for BibTeX, 2x for \LaTeX .

[View a sample solution.](#)



More stuff to do with L^AT_EX

So far, you have only seen a fraction of what L^AT_EX can do. If you want to learn more, a good resource is the [wikibook about L^AT_EX](#).

Here are some examples of what you will find there:

- [How to create a title page.](#)
- [How to create a table of contents.](#)
- [How to add footnotes.](#)
- [How to add mathematic formula.](#)
- [How to create tables.](#)



Sample Solutions for Hands on Exercises

Exercise 1: Basic Document

```
\documentclass[12pt]{book}
\begin{document}
    This is my first LaTeX document.
\end{document}
```

Exercise 2: Document Structure

```
\documentclass[12pt]{book}
\begin{document}
\chapter{Document structure}
    \section{Parts, chapters and sections}
    \section{Spaces and breaks}
        \subsection{Spaces}
LaTeX treats any number of consecutive spaces as one single space. It doesn't matter if the spaces were created by using the space bar or the tab key, even a single line break (using the return key) is treated only as a space.
If you want to add additional spaces, type a backslash before every additional space.
        \subsection{Breaks}
\chapter{Formatting}
    \section{Lists}
\end{document}
```

Exercise 3: Formatting

```
\documentclass[12pt]{book}
\begin{document}
\chapter{Document structure}
    \section{Parts, chapters and sections}
        \begin{itemize}
            \item Parts
            \item Chapters
            \item Sections
                \begin{enumerate}
                    \item Paragraphs
                    \item Subparagraphs
                \end{enumerate}
        \end{itemize}
    \section{Spaces and breaks}
        \subsection{Spaces}
LaTeX treats any number of consecutive spaces as one single space. It doesn't matter if the spaces were created by using the space bar or the tab key, even a single line break (using the return key) is treated only as a space.
If you want to add additional spaces, type a backslash before every additional space.
        \subsection{Breaks}
\chapter{Formatting}
    \section{Lists}
\end{document}
```

Sample Solutions for Hands on Exercises, cont.

Exercise 4: Images

```
\documentclass[12pt]{book}
\begin{document}
\chapter{Document structure}
    \section{Parts, chapters and sections}
        \begin{itemize}
            \item Parts
            \item Chapters
            \item Sections
                \begin{enumerate}
                    \item Paragraphs
                    \item Subparagraphs
                \end{enumerate}
        \end{itemize}
    \section{Spaces and breaks}
        \subsection{Spaces}
```

LaTeX treats any number of consecutive spaces as one single space. It doesn't matter if the spaces were created by using the space bar or the tab key, even a single line break (using the return key) is treated only as a space.

```
\begin{figure}[p]
    \includegraphics[width=0.75\textwidth]{firstfigure}
    \caption{This is the caption for the first figure.}
\end{figure}
```

If you want to add additional spaces, type a backslash before every additional space.

```
\begin{figure}[p]
    \includegraphics[width=0.75\textwidth]{secondfigure}
    \caption{This is the caption for the second figure.}
\end{figure}
```

```
\subsection{Breaks}
\chapter{Formatting}
    \section{Lists}
\end{document}
```

Sample Solutions for Hands on Exercises, cont.

Exercise 5: References

```
\documentclass[12pt]{book}
\usepackage{natbib}
\begin{document}
\chapter{Document structure}
    \section{Parts, chapters and sections}
        \begin{itemize}
            \item Parts
            \item Chapters
            \item Sections
                \begin{enumerate}
                    \item Paragraphs
                    \item Subparagraphs
                \end{enumerate}
        \end{itemize}
    \section{Spaces and breaks}
        \subsection{Spaces}
```

LaTeX treats any number of consecutive spaces as one single space.

\citet{merrill_task-centered_2007} It doesn't matter if the spaces were created by using the space bar or the tab key, even a single line break (using the return key) is treated only as a space.

```
\begin{figure}[p]
    \includegraphics[width=0.75\textwidth]{firstfigure}
    \caption{This is the caption for the first figure.}
\end{figure}
```

If you want to add additional spaces, type a backslash before every additional space.

```
\begin{figure}[p]
    \includegraphics[width=0.75\textwidth]{secondfigure}
    \caption{This is the caption for the second figure.}
\end{figure}
\subsection{Breaks}
```

```
\chapter{Formatting}
    \section{Lists}
    \nocite{fallman_interaction_2008}
\bibliography{example}
\bibliographystyle{plainnat}
\end{document}
```



Modality

The purpose of this lesson is to give graduate students practical principles on how to translate a research paper into other communication mediums.

In this lesson, students will learn:

- What modality is
- The importance of understanding modality
- Key principles in modality

In addition, students will learn how to translate a research paper into the following types of communication mediums:

- Course materials
- Website
- Take-away sheets
- Conference presentations
- Podcast
- Poster presentations

By the end of the lesson, students will be able to:

- Determine and extract the most important information from their research paper
- Tailor information from research paper to fit various communication mediums
- Design research paper to fit various communication mediums

To help your students absorb the information, you could provide mini quizzes throughout these sections to assure that they understand the content before moving on to another section. In addition, you could provide audio and visual elements to retain the interest of the students.





What is modality?

Modality is the conforming of something to a pattern. In the case of this lesson, you will learn how to tailor a research paper to "conform" to other types of communication mediums. Essentially, you will learn how to present a research paper in the form of mediums such as the web, conferences, workshops, and other mediums.

Why is understanding modality important?

Understanding modality is important for graduate students because often times graduate students are required to give in-class presentations of their written work. Those presentations may come in different formats such as presenting online, passing out hand outs to fellow students, etc. In addition, many graduate level students are solicited to attend conferences and workshops in which they may have to present their work. This lesson is designed to equip graduate students to be able to present their work in these and other formats.

Key principles of modality

To effectively translate a research paper into another communication medium, it is important to do the following:

- Extract the most important information from your research paper
- Tailor that information to fit the specific communication medium
- Format your research paper to fit the specific communication medium

The main thing to remember when converting your research paper to other mediums: Keep it simple!

Extracting the most important information from your research paper

When you are translating your research paper into another communication medium, you may not be able to carry over every detail of information. For example, if you converting your 10 page research paper into a 1-2 page take-away sheet, you obviously will not be able to include every detail of your research paper in the take-away sheet. Because of this, it is important to pull the most important information from your research paper.

How do you determine the most important information?

To determine the most important information, you should ask yourself the following questions:

- Why are you imparting information?
- What specific information do you want your audience to take with them?
- What information will help them?



Key principles of modality, cont.

Tailoring information to fit the specific communication medium

In converting your research paper into another communication medium, depending upon the medium, you may have to condense your prose to fit the medium. Condensing your information include methods such as:

- Summarizing information
- Putting information into bullet points

Formatting your research paper to fit the specific communication medium

The layout of your research paper will vary depending upon the medium that you will convert it to. To format your paper appropriately, it is important to know the context by which you are presenting your paper. For example, are you presenting at a conference? Is the conference formNow that you have reviewed some of the principles of modality, you will now learn how to convert your research paper into the mediums listed above.

Modality

Course Materials

The idea behind this medium is to develop the contents in your research paper into instructional-based course materials. To effectively do this, it is important that you:

- Know your audience
- Know the learning styles of your audience
- Adapt your course material to fit the learning styles of your audience

In this section, you could take students through a real module online to give them a vivid representation of a module.

One very effective way to convert your research paper into course material is to develop online modules for each topic within your research paper.

A module is a self-guided learners tool that often includes information about a topic and a self-assessment at the end. It is usually very interactive throughout.

In each of your modules, you would present the information in this order:

1. State your topic
2. State the purpose of the module
3. Indicate specifically what your audience will learn in the module
4. Begin presenting the information on your topic. You can do this in prose with accompanying images. You can also include audio and videos. In addition, you can include fun exercises to help your learners to better assimilate the information.
5. At the end of the module, have some form of self-assessment (i.e. quiz) to test the knowledge of your learners.



Website

Many people want convenience when they go to the web. They want to be able to find information quickly and they don't want to read a lot of text. In fact, research has shown that users read 25% slower on the web than on paper. (Nielsen, 2000) Because of these factors, in converting your research paper to the web, it is good to follow these keys:

- Include no more than half of the information in your paper
- Don't clutter your website
- Make your information scannable (use headings/sub-headings/highlight important points)
- Make it easy to find information
- Put information in a systematic order
- Eliminate too much detail from your paper

In this section,
you could provide
visual scenarios
of good vs. poorly
designed websites.

Take-away Sheets

Take-away sheets are meant to be used as a quick reference document, highlighting only key points. Think of these sheets as merely notes. They are not meant to be read as a book. Because of this, take-away sheets should not be more than 1-2 pages long. In addition, they should not include unnecessary details from your research paper. Take-away sheets should only include key factors from your research paper.

There are different ways that you can condense your research paper to fit a take-away sheet. You can:

- Include merely the abstract portion of your research paper
- Include an outline of your research paper
- Bullet point key information from your research paper

In this section, you
could show students
an example of a
take-away sheet.

Try It!

Convert the research paper you are currently working on, or one you have written previously, to a take-away sheet. When you are finished, continue to the next page to see how you did.



Take-away Sheet Evaluation

Did you...

- keep it under two pages long?
- omit details not central to the understanding of the main idea of your paper?
- cover the key points from your paper?
- use devices like bullet points, an outline, or an abstract to succinctly summarize your information?

If you answered "yes" to all of the questions above, congratulations! You're well on your way to mastering the principles of modality. If you answered "no" to any of the above questions, revisit your take-away sheet and re-think how you might be able to represent the key points from your paper without cluttering the page with too much information.

Now, let's move on to a summary of the principles of effective research paper conference presentations.

Conference Presentation

Here, the process of "converting" your paper really just means presenting it effectively in an oral format, so the basic principles of good presentation apply:

- **Practice, practice, practice.** The more familiar you are with your presentation, the more comfortable and natural you will be.
- **Don't read too much.** Try not to use your paper during the presentation, and instead refer to notecards.
- **Keep it simple.** You won't be able to go into as much detail orally as you did in your paper, so concentrate on communicating a simplified version of your main idea(s).
- **Use visual extensions**, such as overheads, slides, and handouts. Such devices can greatly aid comprehension and recall.

Podcast

Recording a podcast version of your paper is a lot like conference presentation; in both cases, the essential activity is describing your paper out loud. However, with a podcast, you may not have a live audience when you are recording, and subsequent listeners will not have the benefit of any visual extensions. A few things to consider:

- **Again, practice.** The more times you go over it, the smoother you will sound on the recording.
- **And again, keep it simple.** You can probably get into about the same level of complexity as in a conference presentation.
- **Speak with a dynamic voice.** As the main product here is entirely audio, the sound of your voice is especially important. Vary your tone, range, and pitch to emphasize certain points and maintain listener interest.
- **Visual extensions.** Consider slides or some other digital visual aid to supplement your podcast.

To reinforce these sections, you may wish to have students practice speaking with a dynamic voice by reading the introduction to their papers out loud (or the introduction to one they have written previously). To take this exercise a step further, you could help them develop summarization skills by then having them try to explain the introduction out loud without looking at their papers.



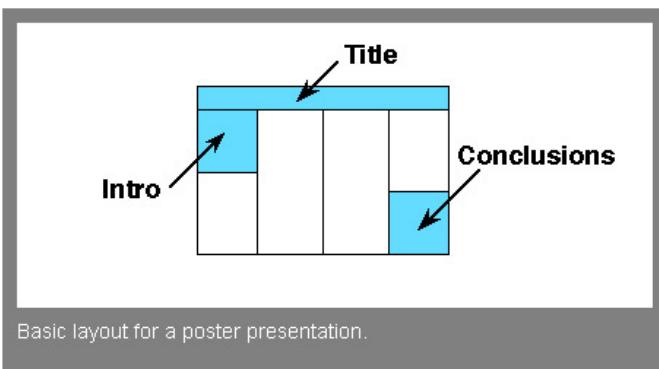
Poster Presentation

The main thing to keep in mind when converting your paper to a poster presentation is *keep it simple*. Focus on one essential idea/concept/question from your paper, and rely on graphical elements to leave the viewer with an explicit take-away message. After making this determination, there are only a couple of other steps to complete before you can get started:

1. **Determine the size of your poster**--42 x 42", 42 x 48", and 42 x 52" are all common sizes.
2. **Develop an outline**; sketching it out on paper is a great way to do this.

Once you have the basics mapped out, you can start to lay down the specifics. Some pointers:

- **Layout:** Your title will go across the top, your intro in the upper-left corner, and your conclusion(s) on the bottom right of the poster. Methods, results, and discussion will fill the remaining sections.
- **Graphics/Text:** Emphasize graphics over text, and don't make it too dense--20-25% text, 40-45% graphics, and 30-40% empty space is said to be an effective ratio.
- **Graphics** can include things like photos, figures, graphs, charts, and tables.
- **Text** is primarily used to support your graphics, so keep it simple. Bullets and abbreviations can help with this.
- **Readability:** All of your text and graphics should be readable at a distance--at least 6 feet away for everything but the title, which should be readable at a distance of at least 15 feet. San serif fonts are best for poster presentations. Also, avoid italics, as they are difficult to read in this format.
- **Color:** For most presentations, 2-3 colors will be plenty, and soft tones are usually best. Too much color can distract from your message.
- **Acknowledgement Section:** If you have anyone to thank for research contributions or funding.
- **Take-away Sheets:** Consider providing take-away sheets summarizing your paper or display--you can get a bit more specific here, as people will be willing to spend more time analyzing something they can view on their own time.



To reinforce this section, you could have the students sketch a poster version of their research paper (or one they have written previously) on a piece of paper. You could collect these for evaluation, walk around the room as they work on them to inspect their progress, or simply let this be a self-guided exercise.



Professionalization

In the academy, scholars share their ideas with each other through various professional activities and publications. Academic journals and conferences developed out of a need for scholars to efficiently and effectively share developments in research with each other. In order to participate in the academic community, individuals are expected to keep current with research that is being conducted in their area of scholarship. If you are seeking a job in the academy, it is vital to your career prospects that you present at and attend conferences, as well as submit your research work for publication in field-relevant journals.



If you have a paper copy of an academic journal available that you can pass around, bring it in. Sometimes seeing and flipping through a physical manifestation of the journal helps students understand the fact that these are periodical publications.

To many students, this is a daunting prospect. Consider, however, that the types of projects and research that you are conducting in your Master's and Ph.D. level courses are the types of projects that students like yourself are presenting at conferences and developing into articles for publication in professional journals.

Emphasize the fact that graduate (and sometimes even undergraduate) students regularly participate at conferences to help demystify the idea of “the conference.”

When developing a research project for your course, keep in mind how your ideas and research fit into the conversation that is occurring in journal articles that you are reading. A good project will have something to contribute to that conversation. For instance, you may disagree with one scholar's interpretation or you may find a perspective from a related discipline that has not been considered by other authors. If this is the case, then you are in a good position to share your findings at a conference or in an academic journal.

The book *They Say/I Say* by Graff and Birkenstein (2006) has examples that can be used in conjunction with this lesson, or as a reference for students who need assistance understanding the fundamentals of academic discourse

Lesson Goals

By the end of this lesson, you will have a clear understanding of the general procedures for submitting conference proposals and for submitting articles to academic journals. You will also have the opportunity to write your own proposal and put into action your knowledge of the concepts covered in the course thus far.

Why Discuss Professionalization in a Research Paper Course?

The difference between graduate research and undergraduate research is that graduate research projects expect you to critically engage in the discussions that are occurring between scholars in your field. Since you are doing this in your research anyway, why not take the products of your work and share them with others in a professional setting?

There are numerous places to tie in examples from other lessons in this section, as a proposal will draw on. Look for opportunities to tie in other lessons, especially research, data, style, and versioning.



Conferences

There are several major conferences in the field of technical communication, each with a different focus on particular areas of scholarly research. Here are just a few major conferences where technical communication scholars and professionals present their research:

- [International Conference on Web-based Learning \(ICWL\)](#)
- [IEEE International Conference on Communications](#)
- [Computers and Writing](#)
- [International Conference on Writing Research](#)
- [Society for Technical Communication \(STC\) Technical Communication Summit](#)
- [Association for Teachers of Technical Writing \(ATTW\) Conference](#)
- [Conference on College Composition and Communication \(CCCC\)](#)

Call for Papers

A call for papers (CFP) is a formal request from a conference for scholars and professionals to submit proposals for consideration by the conference organizers. CFP's are issued several months before a conference and provide details about what types of presentations will be taking place at the conference and what the conference theme is. While it is not a "deal breaker" if your research does not match the theme of the conference, you should consider how your project relates to the conference theme (or how it could be modified to do so) when writing your proposal.

Look to some of the above conference sites for examples of past CFP's to show the students.

Finding Conferences

In addition to the conferences listed above, you can search for conferences and CFP's on conference websites and aggregators. Use [Google](#) to search for Tech Comm conferences, subscribe to listservs (e.g. [ATTW Listserv](#)), check professional organization websites (e.g. [Council for Programs in Technical and Scientific Communication \(CPTSC\)](#)), or follow professional organizations on [Twitter](#) (e.g. [Society for Technical Communication](#)).

Additionally, check [aggregator sites](#) that list a wide array of conferences. Depending on your research area, you may find some CFP's from conferences outside of Tech Comm that fit your interests.

Other Considerations:

If your proposal is accepted, you will need to prepare your presentation and travel to the conference. Only apply to conferences you can reasonably attend.

Time permitting, you could have your students sign up for a twitter account, and search for and follow professional organizations and IIT Tech Comm students and instructors/professors.



Writing a Proposal

While there are [resources](#) that can help you successfully write a conference proposal, some general guidelines are:

- **Be clear and concise**

Avoid wordy and difficult to understand phrases or sentences, and use terminology that you feel the reviewers will be able to understand at first glance

- **Summarize your research**

The proposal gets you in the door. Think of a proposal as a formal elevator pitch: you are highlighting the salient points of your research. You needn't make every point in your entire paper fit into the proposal.

- **Make your point immediately**

Your first sentence should be the main point of your paper.

- **Stay within the word count and meet the deadline**

If you are too verbose or you miss the deadline, don't be shocked if your proposal is rejected. Conference organizers must group presenters into panels of related topics, and that is like putting together a jigsaw puzzle. If you fail to make a clear, concise proposal, or if you submit your proposal after the panels are formed, your project might be the extra piece that doesn't fit in.



Academic Journals

Peer reviewed or refereed journals are the publications that scholars utilize to communicate new research and findings. Journals are particular when selecting research to be published, and often require several revisions of a potential article before it appears as a published work. Although you can adapt your research paper to fit the content requirements of a journal as discussed in the [Topic](#) lesson and you can reformat your paper to meet the style criteria of journals as discussed in the [Style](#) lesson, it is useful to examine publication requirements during your planning stages so that your finished paper is closer to the specifications of the journal you wish to submit to.

Ask students if they know what peer reviewed means. Many students do not.

There are five major journals in technical communication:

- [Technical Communication](#): Published by the Society for Technical Communication
- [Technical Communication Quarterly](#): Published by the Association for Teachers of Technical Writing
- [IEEE Transactions on Professional Communication](#): Published by the Professional Communication Society of the Institute of Electrical and Electronics Engineers (IEEE)
- [Journal of Technical Writing and Communication](#)
- [Journal of Business and Technical Communication](#)

Each individual journal has specific guidelines about what types of research and articles they will accept for publication (see the [Topic](#) lesson for more details). For instance, some journals will only accept new research and are not interested in bibliographic studies or compendiums of data. Likewise, some journals place an emphasis on research studies or experiments. For each journal, read the section of their website that describes what types of research are accepted or typically published. If your research does not fit into those areas, it would be wise to make an inquiry to the journal to which you wish to submit your manuscript prior to devoting a large amount of your time to formatting and submitting your article.

Other Considerations:

Submitting an article and having it accepted to a journal is not the end of your work. You will need to make revisions, edit stylistic elements or graphics, and review proofs prior to submission. Allow time for this when planning out your submission process.

You could show your students an example of article guidelines here, but remember that part of the final exercise is for students to find this information, so maybe choose an example that is harder to find and leave the easier examples for the final exercise.

Explain the difference between editing and revising if students can't tell you the difference.



Professionalization: Try it out!

Now that you have learned about how scholars in technical communication share their work with each other, try the following exercises to practice developing your work into a format consistent with professional development.

Conference Proposal

Think about how you can use the research paper you have written to develop a proposal for a conference. You will need to:

1. Find a conference that you are interested in submitting to;
2. Write a proposal that meets the guidelines in the conference's CFP;
3. Review and revise your proposal (preferably with feedback from an instructor or peer);
4. Submit your proposal and other conference materials before the deadline

This exercise will probably work best in pairs.

Once you have your proposal finished, have a friend or classmate read it. Ask him or her to explain the ideas in your proposal back to you as he or she understand them. A well worded, concise proposal should give the reader a clear idea of your most significant findings and how you intend to present them at a conference. If either your ideas or your intended method of presentation are unclear to the reader, ask him or her follow up questions that will help you make revisions to your proposal.

Scholarly Article

Using the list of major publications in Tech Comm, try to find the requirements page for scholars interested in submitting original work on the journal's website (hint: if you can't find the style pages, take a look at one of the other lessons in this course!). Once you have found it, read through the different types of papers and studies that they will accept and publish. Take special note of the specific requirements for each type of publishable work.

This exercise can be done in small groups, and then each group member can summarize their experience for the class.

Once you have read through the guidelines, come up with a way to adapt the research paper or idea that you have come up with to fit each type of paper or study. If your research does not have an experimental component to it, try to imagine how you could design an experiment that would test a concept or conclusion you have reached in your paper. For example, if you are writing about the need for inclusion of more ethical training in the field of technical communication, perhaps you could design an experiment that tests the knowledge of basic ethics in students or practitioners of technical communication, or your study could involve a survey to see if practitioners agree with your supposition that there is a need for additional ethics training within the field.

What happens next?

If your proposal is accepted, you will need to make plans to develop your conference presentation or appropriate conference materials and register for the conference. Likewise, if your article is accepted for publication, you will need to begin the editing and revision process and plan on reviewing proofs prior to its final publication. Remember, professional activities such as these are undertaken separately from your coursework, so allow yourself extra time to work on professional activities outside of your regular academic schedule.

Explain that professional activities for a student must occur at the same time as school, assistantships, and other academic obligations.