



Research Methods in Science in Engineering

# Literature Searching & Reading

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## Outline

- Getting started on a topic
- Searching the literature
- Reading a journal article



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# Getting Started on a Topic

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## Getting Started on a Topic

Journal articles are probably not the best place to get started learning a new topic. They are very difficult to read and rarely devote much effort to introducing the subject area.



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## Getting Started on a Topic

Try the following resources to get better introductory and background material:

- Textbooks
- M.S. theses
- Ph.D. dissertations
- Websites (Wikipedia, etc.)
- Review articles
- Personal conversations



Textbooks



Websites



MS theses and  
PhD dissertations

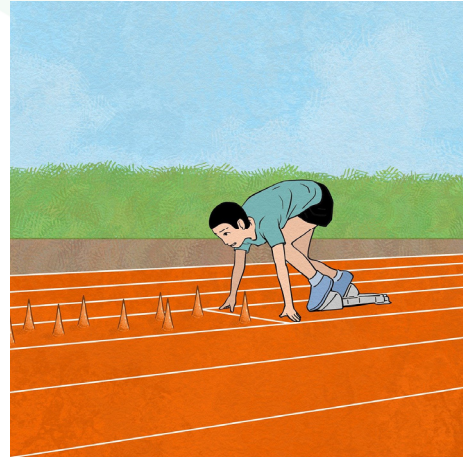


Conversations

## Searching the Literature

## Starting the Search

- Sometimes, getting started is the most difficult, especially for new and obscure topics.
- Identify the key words.
- Do whatever you can to find those first one or two items from the literature. Lean on those to find more.



## Identify Sources & Databases

- UTEP Library Search  
<https://www.utep.edu/library/research/library-search.html>
- IEEE Xplore  
<https://ieeexplore.ieee.org/Xplore/home.jsp>
- Google Scholar  
<https://scholar.google.com/>
- APS Physics Journals  
<https://journals.aps.org/>
- Optica  
<https://www.osapublishing.org/>
- SPIE Digital Library  
<https://www.spiedigitallibrary.org/>

*These are just  
some examples.*

## Consider Searching in Waves

- Wave 1
  - Pick a topic and/or question(s).
  - Download everything relevant that can be found.
  - Read what has been found and take notes.
- Wave 2
  - Refine the topic and/or question(s).
  - Download everything relevant that can be found.
  - Read what has been found and take notes.
- Repeat until new information cannot be found.



## Obtaining Items from the Literature

- Most modern items in the literature are available as PDF.
- Use the university library to obtain textbooks, journal articles, etc., that cannot be accessed online.



## Stay Organized!

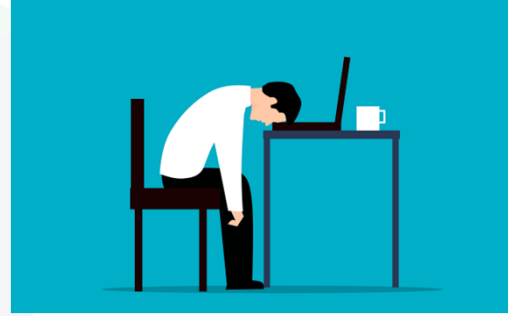
- Organize the information.
- Take notes and make maps of subjects



## Reading a Journal Article

# Why are Journal Articles Hard to Read?

- They are dense and complicated
- Many concepts are presented but not explained
- Very limited introductory material.
- Bad writing.
- They are boring
- Reading the article incorrectly
- You may not have the background to understand



# How to Read a Journal Article

## Step 1 – Read the abstract

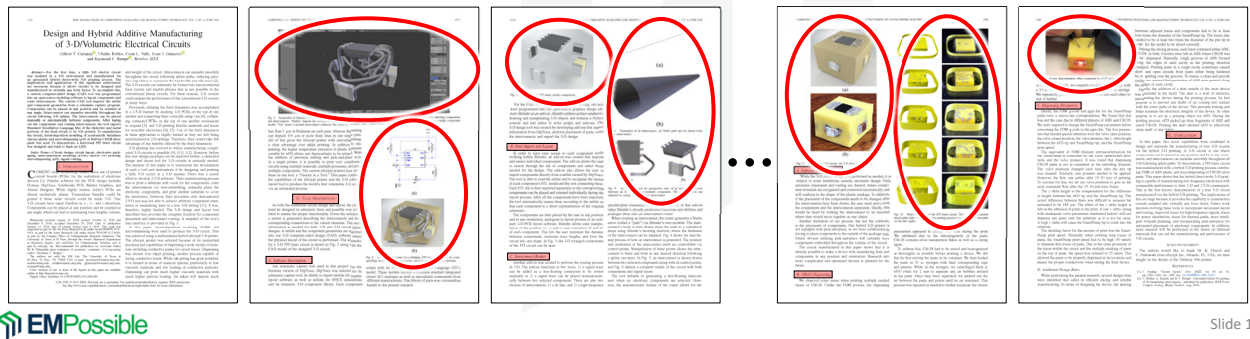
The abstract typically uses the simplest language and is specifically intended to give all the information needed to determine if the article is what is desired. Disregard the article if it is not meaningful to the research.



## How to Read a Journal Article

### Step 2 – Scan the Article

Get an idea of the value of the paper by looking at diagrams, equations, section headings, etc.



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## How to Read a Journal Article

### Step 3 – Stop Reading of Article Does Not Make Sense

Skip the most difficult articles when starting the search. Save them for later.



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# How to Read a Journal Article

## Step 4 – Read the Introduction

The introduction is the most valuable part of an article when starting a literature search. Identify relevant key words and literature sources cited by the paper. Use those for additional literature searching.



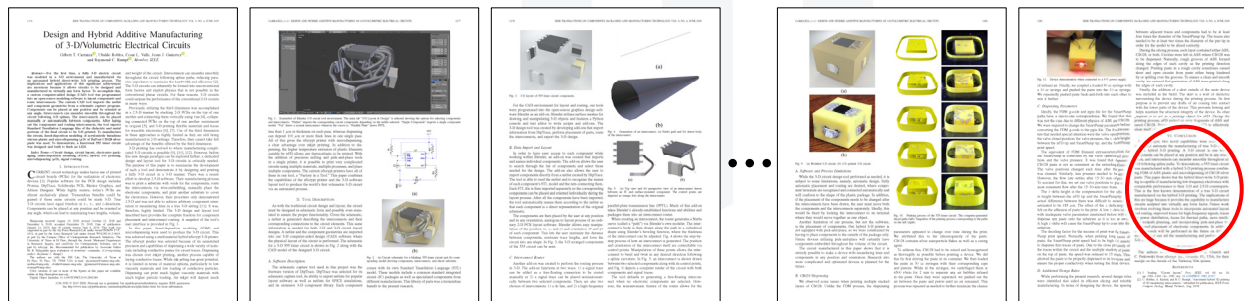
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# How to Read a Journal Article

## Step 5 – Read the Conclusion

The key results and new information of the paper are summarized in the conclusion. If the results are not new or not interesting, stop here.



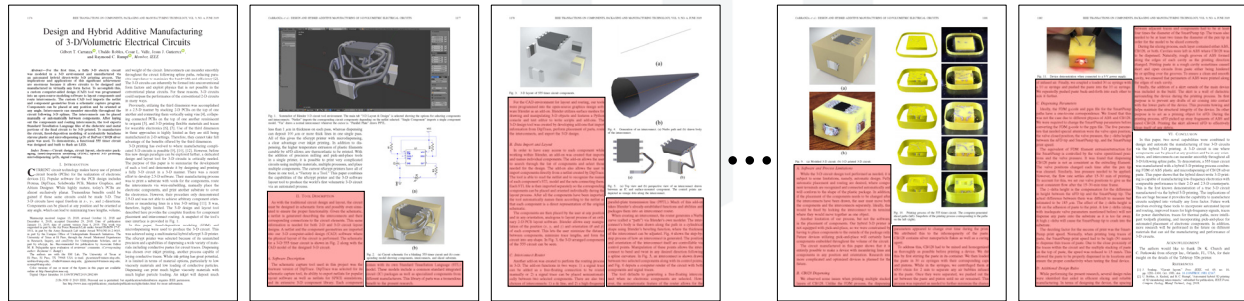
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# How to Read a Journal Article

## Step 6 – Read the Rest of the Article

Read the methods and body of the article only if it is relevant to the research and the paper is worthy of attention.



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# How to Read a Journal Article

## Step 7 – Take Notes

Consider importing PDFs into a tool like OneNote so things can be highlighted, notes and comments can be added, etc.



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# Conclusion

- Reading the literature can be difficult!
- Get started with the right resources.
- How to perform a comprehensive literature search.
- How to read a technical journal article.