

Research and Presentation Skills

FIU Hurricane Research Internship

August 12, 2013

Ibn Al-Haytham (965–1039 CE)

- Early pioneer of the scientific method
- *“Truth is sought for its own sake. And those who are engaged upon the quest for anything for its own sake are not interested in other things. Finding the truth is difficult, and the road to it is rough.”*

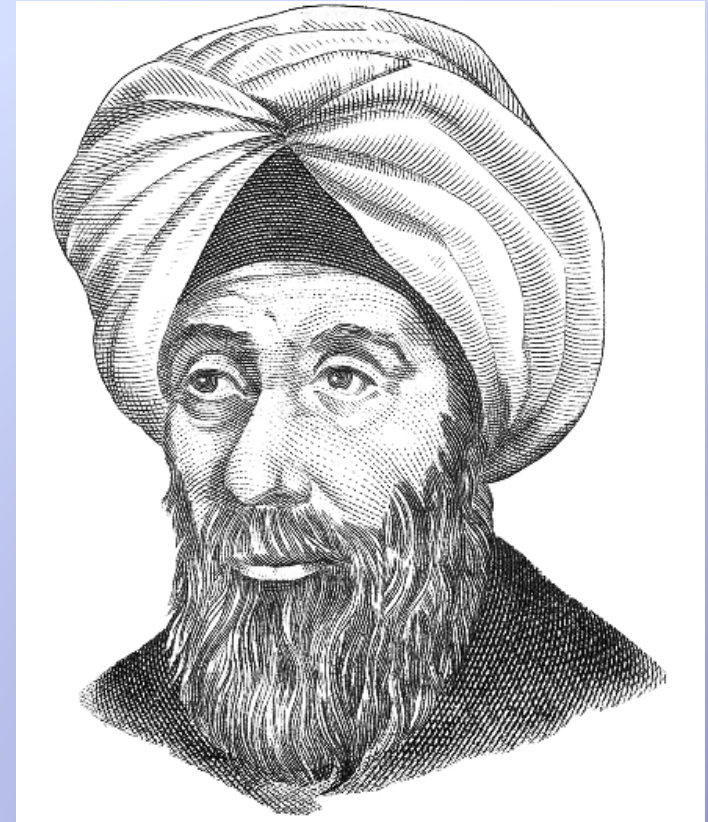


Image: Wikipedia



Scientific Method

1. Define a question
2. Gather information and resources (observe)
3. Form an explanatory hypothesis
4. Perform an experiment and collect data, testing the hypothesis
5. Analyze the data, interpret the data and draw conclusions

1. Define a Question

- Finding a research problem:
 - Simple, carefree browsing
 - Specifically search for related articles
 - Find specific research questions posed in other articles
 - Observations
- Formulating a question:
 - Who, what, when, why, and how?
 - Correlations, causations, relationships

Asking Questions

- Very important research skill
- If a question pops up during a lecture, ask
- Participate when lecturer asks for audience responses
- Other tips to try:
 - Circle slides/phrases in the lecture notes that are not clear
 - If you can not think of how to phrase a question, stop and ask to “further clarify” or “repeat the previous statement again” or “What do you mean by ___?”

2. Gather Information

- Research Data and Information is everywhere on the Internet:
 - Government sites (NHC, NRL)
 - University research projects (CIMSS)
 - Scholarly Journals
 - Personal webpages/Wikipedia
- Libraries and Textbooks are useful as well

Wikipedia

- Good for storm tracks and summaries
 - Example: “2005 Atlantic Hurricane Season”
- Many pages on active research topics are short/poor, others are ok.
- Information is generally accurate, but it is best to use the links in Wikipedia (at the bottom of the page) to the actual citations instead of citing Wikipedia

Textbooks

- Textbooks are good for finding summaries of scientific written in a clear and logical order
- The best textbooks on hurricanes and remote sensing are:
 - Kerry Emanuel: Divine Wind
 - Grant Petty: A First Course in Atmospheric Radiation
 - Grant Petty: A First Course in Atmospheric Thermodynamics
 - Rauber et. al: Severe & Hazardous Weather

How to find books

- FIU Library Website: search Green Library for “Hurricanes”, “Remote Sensing”, “Meteorology”, etc.
- Bookshelves: If you find an interesting book, always check the adjacent shelves for other books that may also be on topic. Books are organized by topic in the FIU library. (Meteorology is QC 851-999, Cyclones are QC 940.6-959, located in GL, 6th floor)
- Tip: you can also request books from **any college library in the state of Florida** through Uborrow. They will deliver them within a week to the FIU library.
- Some FIU library books are available in electronic form
- Google Book Search
- Amazon

Google Scholar

The screenshot shows the Google Scholar search interface. At the top left is the Google Scholar logo. To its right is a search input field containing the text "rapid intensification". A "Search" button is located to the right of the input field. Further right is a link for "Advanced Scholar Search". Below the search bar is a navigation bar with the word "Scholar" on the left. To its right are three dropdown menus: "Articles and patents", "anytime", and "include citations". To the right of these menus is an envelope icon and a link for "Create email alert". Below the navigation bar is a search result. The title of the article is "Effects of surface energy fluxes during the early development and **rapid intensification** stages of seven explosive cyclones in the western Atlantic". Below the title is the author information "YH KUO - Monthly weather review, 1991 - csa.com". The abstract text follows: "Effects of surface energy fluxes during the early development and **rapid intensification** stages of seven explosive cyclones in the western Atlantic. YING-H KUO Monthly Weather Review 119, 457-476, 2/1991. The role of surface ...". At the bottom of the result are links for "Cited by 86", "Related articles", and "All 4 versions".

Google scholar rapid intensification Search [Advanced Scholar Search](#)

Scholar Articles and patents anytime include citations [Create email alert](#)

[Effects of surface energy fluxes during the early development and **rapid intensification** stages of seven explosive cyclones in the western Atlantic](#)

YH KUO - Monthly weather review, 1991 - csa.com

Effects of surface energy fluxes during the early development and **rapid intensification** stages of seven explosive cyclones in the western Atlantic. YING-H KUO Monthly Weather Review 119, 457-476, 2/1991. The role of surface ...

[Cited by 86](#) - [Related articles](#) - [All 4 versions](#)

<http://scholar.google.com/>

AMS Journals

- <http://journals.ametsoc.org/>
- Not available to general public, need to be on FIU network or logged on to MyFIU to access
- Use search box at top, can then refine search on next page:

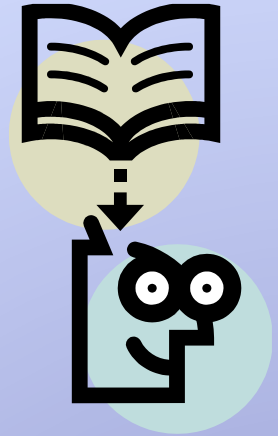


Browsing Journal Articles

Reading a full article can take hours.

To speed up the process:

1. Read Abstract, first part of Introduction, and Conclusion
2. Look at figures and read captions
3. Read relevant sections closely, look up cited papers in those sections for further information



3. Forming a Hypothesis

- Definition: a proposed explanation for a phenomenon
 - Example: “Hurricane Katrina rapidly intensified over the Gulf because it passed over the warm loop current and had an upper level anticyclone supporting its outflow.”
- Take into consideration:
 - Testability
 - Simplicity
 - Scope
 - Fruitfulness
 - Conservatism

4. Collect Data/Test Hypothesis

- Selectively choose data
 - Diversify
 - Stay on topic
- Refining your hypothesis
 - Follow the leads of your results
 - Example: “Hurricane Katrina rapidly intensified over the Gulf because it passed over the warm loop current and had an upper level anticyclone supporting its outflow, BUT eyewall replacement cycles limited the extent of the intensification.”

5. Analyze the Data, Interpret, Draw Conclusions

- Make a scientific argument:
 - Similar to a thesis
 - Use your best observations/results to support your hypothesis
 - The best papers/presentations are persuasive:
 - Clearly defined thesis
 - Well explained evidence supporting thesis
 - Argument does not have to be complicated
 - Example: “Factors for/against Katrina’s rapid intensification in Gulf”

PowerPoint Presentations

- Strengths
 - Conventional method for communicating ideas
 - Helps outline talks
 - Visuals, Images, and Figures
- Weaknesses
 - “Fluff” or too much content
 - Inconsistencies and poor formatting can look unprofessional
 - Temptation to read slides instead of facing audience

Text Content

- Not too much, not too little
- Cite outside sources
- Font choice: use Sans Serif fonts
 - Use: Calibri, Ariel, Helvetica
 - Avoid: Times New Roman, Georgia
- Do not read the slides, face the audience

Images/Layout

- Make sure images are large enough
 - OK to cover entire slide if necessary
- Color scheme
 - Be consistent
 - Use neutral tones
- Only use animations if they contribute to the presentation
- Always think “Professional”



Before the Presentation

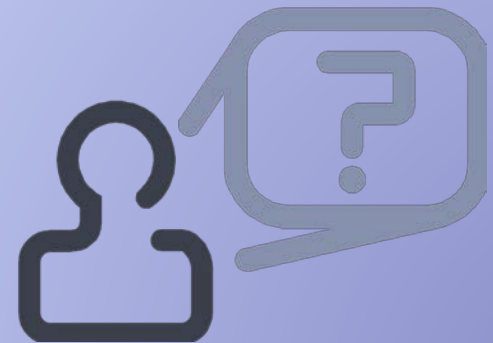
- Practice, Practice, Practice!!!
- Test in actual presentation setting if possible
- Double-check all links/clips/images
 - Especially when using a different computer
- Make a note sheet or note cards with your main points highlighted
 - Do not read directly off notes, have the notes in case you get stuck

Speaking Skills

- Relax!
- Practice speaking in the mirror if you have a propensity to talk too fast
- Avoid “extraneous vocalizations”
 - To practice: have friend/partner in audience hold up a red card every time you say “umm” or “like”
- Annunciate words clearly
- Speak to the back of the room
- Eye contact

Answering Audience Questions

- You are the expert, do not be intimidated
- Clarify further points, go into additional detail
- If you do not know the answer:
 - Do not guess or make something up
- Hostile Questions
- What to do if there are no questions
- Best kind of answer
 - Short, simple, concise



References

- Booth, W. C., Colomb, G. G., & Williams, J. M. (2008). *The craft of research*. Chicago: University of Chicago Press, 329 pp.
- Schick, Theodore; Vaughn, Lewis (2002). *How to think about weird things: critical thinking for a New Age*. Boston: McGraw-Hill Higher Education.
- Thanks to Rebecca Fronczak (Joe's wife), former software trainer, for help with the PowerPoint slides