Hello!

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Goals

● Attendees will gain an understanding of how and when transfer students do/ do not gain research and critical thinking skills.

● Attendees will adapt and improve assignments or lessons that help transfer students gain research and critical thinking skills.
Agenda

● Where and how our students learn research and critical thinking skills.

● What transfer students may not have learned about research and critical thinking, and why this might be surprising to you.

● How to integrate these concepts and skills into your course.

● Assignment design activity
Where do our students learn research and critical thinking skills and concepts?
“Students will be able to:

● Prepare and present a compelling substantive interpretation, argument, and/or analysis of a problem or issue in a research paper.

● Gather and use academic resources effectively and according to the standards and rules of academic integrity in formulating and presenting a substantive interpretation, argument, and/or analysis of a problem or issue.

● Understand and evaluate the nature and possible causes and implications of events, behavior, problems, and issues from an informed and intellectually balanced perspective.

● Connect concepts and empirical evidence in logically coherent, valid, and compelling ways.”
Towson Seminar

- Librarians work with nearly all sections, often with multiple sessions.

- Typical sessions include:
  - Introduction to research process
  - Introduction to different types of sources and their uses
  - Evaluation of sources
  - Using databases
  - Plagiarism
  - Citations
“Students will be able to:

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- Understand and evaluate the nature and possible causes and implications of events, behavior, problems, and issues from an informed and intellectually balanced perspective.
- Connect concepts and empirical evidence in logically coherent, valid, and compelling ways.”

-Learning Goals and Related Course Outcomes Applied To 14 Core Requirements
How can we help our students learn research and critical thinking skills and concepts?
Acknowledge what you know is not common knowledge outside of academia.
Threshold Concepts

- They become things you just know.
- It’s easy to forget others do not share this knowledge

Image from: https://www.flickr.com/photos/stephengodwin/226294975/
Threshold Concepts

They are also things you cannot unlearn.

- Riding a bicycle
- Reading

Image from: https://flic.kr/p/uCC4mt
It’s not obvious that...

- Authority is constructed/contextual
- Info products are a result of process
- Info has different types of value
- Research is ongoing inquiry
- Scholarship is a conversation
- Searching is strategic/exploratory
Authority is constructed/contextual

Students take articles from Dr. Oz or Dr. Phil

Image from:
https://www.flickr.com/photos/jobriga/8732394672
Information products are a result of process

Students inappropriately use personal experiences or anecdotes to illustrate generalizable truth.
Info has different types of value

Students think any citation is a good citation.
Research is ongoing inquiry

Students determine a thesis before they have evidence to support it, then struggle to find articles which fit.
Scholarship is a conversation

Students do not include or attempt to engage counter arguments.
Searching is strategic/exploratory

Students switch topics at the first sign of difficulty in their search.
You are empowered to address the variable skills and experiences of students in your courses.
Course integrated strategies

- Scaffolding
  - Modeling
  - Practical explanations
  - Build on existing knowledge
Assigning the Research Project

- Set expectations for the process and final product.
- Gauge student understanding and clarify.
- Reflect on your own assumptions about what students know.
Assigning the Research Project: Practical Explanations

Why do you require peer-reviewed sources?

Why do you want students to use a print book from an academic press?

Why do you require X?
Assigning the Research Project: Activity Ideas

- Document the requirements in your syllabus, Blackboard, or elsewhere.
- Dedicate class time to review the assignment and generate questions about your requirements and description.
- Provide examples of successful work.
- Offer specific information about support services, like the Writing Center and the Library.
Choosing a Topic

- Acknowledge that research is an iterative process.
- Topics should change throughout the semester and eventually become a research question or a thesis.

Image from: https://flic.kr/p/bsGWaz
Choosing a Topic: Dos and Don’ts

**Don’t**

- require students to stick to their “approved” topic.
- give students a list of broad topics to choose from without explaining that they will need to refine the topic as they learn more.

**Do**

- encourage topic development throughout the semester through check-ins or assignments.
- encourage/ require students to do background reading from their textbook, the Internet, wikipedia or library reference sources.
- avoid “book reports” by encouraging research questions or thesis.
Choosing a Topic: Assignment Ideas

- Topic interest reflection
- Journaling about background reading
- Concept Mapping
- Build on existing know through small or large group discussions to share knowledge.
- Multiple check-ins on research topic (how has your topic changed, what questions are you exploring, etc) through journaling or other written assignments.
Finding, Reading, Evaluating Sources

- Students often do not know where to find credible information, especially scholarly sources.
- Students often do not know how to evaluate credibility or differentiate source types.
- Students often do not understand when and how to use different information sources.
## Finding, Reading, Evaluating Sources: Dos and Don’ts

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<thead>
<tr>
<th>Don’t</th>
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<td>● restrict only to scholarly articles especially for timely topics.</td>
<td>● explain different types of information and their uses (i.e. news articles, background information, statistics, research articles and when appropriate to use in a paper).</td>
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<td>● expect students to know how to use library databases.</td>
<td>● hands on practice using databases or other finding tools for scholarly information.</td>
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<td>● Expect students to understand what scholarly research is or who is authoritative.</td>
<td>● require students to analyze sources and how they might fit into their paper.</td>
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Finding, Reading, Evaluating Sources: Modeling

Share your research, how you engage with your field, how you conduct research, publish, communicate with scholars.

Image from:
https://commons.wikimedia.org/wiki/File:Chemist_Kristina_Edstrom.jpg
Finding, Reading, Evaluating Sources: Modeling

**Read and analyze a journal article together.**

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**Association Between Residential Greenness and Cardiovascular Disease Risk**

Ray Y. H. Ng, PhD, Daniel W. Riggs, MS, Nathalia Delamari, PhD, David J. Tucker, MD, Jeffrey Wilkins, PhD, Daniel J. Corrigan, PhD, Timothy E. St-Onge, PhD, James McCracken, PhD, Pawel Lissowski, PhD, Zongyi Xia, PhD, Nagra Shrestha, MD, Rachael J. Smith, PhD, Andrew Daphnis, MD, Shana R. N. Kao, PhD, Gilbert Liu, MD, Arijit Bhattacharya, MD

**Background:** Exposure to green vegetation has been linked to positive health, but the pathophysiological processes affected by exposure to vegetation remain unclear. To study the relationship between greenness and cardiovascular risk, we examined the association between residential greenness and biomarkers of cardiovascular injury and disease risk in susceptible individuals.

**Methods and Results:** In this cross-sectional study of 408 individuals recruited from a preventive cardiology clinic, we measured biomarkers of cardiovascular injury and risk in participant blood and urine. We estimated greenness from satellite-derived normalized difference vegetation index (NDVI) in areas with radii of 250 m and 1 km surrounding the participants' residences. We used generalized estimating equations to examine associations between greenness and cardiovascular disease biomarkers. We adjusted for residential clustering, demographic, clinical, and environmental variables. In fully adjusted models, contemporaneous NDVI within 250 m of participant residence was inversely associated with urinary levels of epinephrine (β=-0.99, 95% confidence interval, -1.5, -2.3; p=0.01 NDVI) and F2-iso-prostaglandins (β=-0.96; 95% confidence interval, -1.9, -2.0; p=0.01 NDVI). We found stronger associations between NDVI and urinary epinephrine in women, those not on β-blockers, and those who had not previously experienced a myocardial infarction. Of the 15 subtypes of circulating angiogenic cells examined, 11 were inversely associated (β=-0.58 to -0.78; p<0.001). NDVI, whereas 2 were positively associated (β=0.76 to 0.45; p=0.001) with contemporaneous NDVI.

**Conclusions:** Independent of age, sex, race, smoking status, neighborhood deprivation, statin use, and roadway exposure, residential greenness is associated with lower levels of sympathetic activation, reduced oxidative stress, and higher angiogenic capacity.

**Key Words:** cardiovascular disease risk factors, catecholamine, endothelial progenitor cells, environment, greenness, normalized difference vegetation index, oxidative stress.
Finding, Reading, Evaluating Sources: Modeling

Invite others to your classroom to share their own experiences as researchers. They may also reinforce the messages you give to students.

Image from: https://www.nps.gov/mora/learn/education/classrooms/guestspeakers.htm
Finding, Reading, Evaluating Sources: Assignment Ideas

- Share your research, how you engage with your field, how you conduct research, publish, communicate with scholars.

- Take students through how you would search on a topic from start to finish, showing how to use a library database or refer students to specific databases.

- Read and analyze a journal article together.

- Invite others to your classroom to share their own experiences as researchers. They may also reinforce the messages you give to students.

- Require an annotated bibliography
Synthesis and Writing

● Some students have NEVER written a research paper.
● Some students have never written an outline.
● Some students may not share your understanding of what it means to support a claim with credible evidence.
Synthesis and Writing: Dos and Don’ts

Don’t

● expect students to know how to organize their paper.
● expect that students will understand the purpose a research paper.
● assign a research paper without requiring multiple steps/check-ins along the way.

Do

● explain research paper objectives.
● give example papers.
● engage students in activities which require the same skills on a smaller scale.
Synthesis and Writing: Assignment Ideas

- Require students to write an outline and a draft.
- Have students meet with peers to “pitch” the research on their topic.
- Discuss in class what constitutes a “good” paper.
- Require students to bring a draft to the Writing Center or do an in-class peer review of each others papers.
Citing and Plagiarism

- Students may see this as a drag and a chore.
- They get hung up and frustrated by the mechanics.
- Emphasize the larger purposes and value of citation and how it relates to plagiarism.
Citing and Plagiarism: Dos and Don’ts

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<td>● expect students to have a clear understanding of citation format.</td>
<td>● explain what you are requiring</td>
</tr>
<tr>
<td>● expect students to have a full understanding of plagiarism.</td>
<td>● explain WHY it's important</td>
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<td>● assume they know where to get guidance.</td>
<td>● instruct on where to get guidance.</td>
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<tr>
<td>● treat citation as merely mechanical.</td>
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Citing and Plagiarism: Assignment Ideas

● Discuss and define plagiarism in class and how to avoid it.

● Demonstrate your own tools and tricks for keeping track of sources and creating citations.

● Offer early opportunities to practice making citations paraphrasing without penalty for mistakes.

● Citation relay game!
Support IL in your Assignments

6 in 10 handouts recommended students consult library shelves for research...

more than any other resource mentioned in the handouts analyzed.
Activity - 5 minutes

In small groups review the research assignment.

Brainstorm improvements to this assignment, considering the variable nature of student skills and experience in upper level classes.
Activity - Report out

What improvements would you suggest for getting the best results from students on this assignment?
No need to reinvent the wheel
No need to reinvent the wheel
No need to reinvent the wheel

- **CORA**: Community of Online Research Assignments
- **MERLOT**: Multimedia Educational Resource for Learning and Online Teaching
- **Information Literacy Sandbox**
Thank you!

Questions?

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Image from:
https://www.pexels.com/photo/thank-you-text-on-black-and-brown-board-908301/
Resources

Either our citations and/or further reading