Rumor Has It: How Exploring Research Engagement through Metrics Transforms Student Learning

Rachel Miles, Research Impact Librarian
Amanda MacDonald, Undergraduate Research Services Librarian

UNIVERSITY LIBRARIES
VIRGINIA TECH.

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Introductions

Amanda MacDonald
abmacdon@vt.edu

Rachel Miles
ramiles@vt.edu
@metric_guru

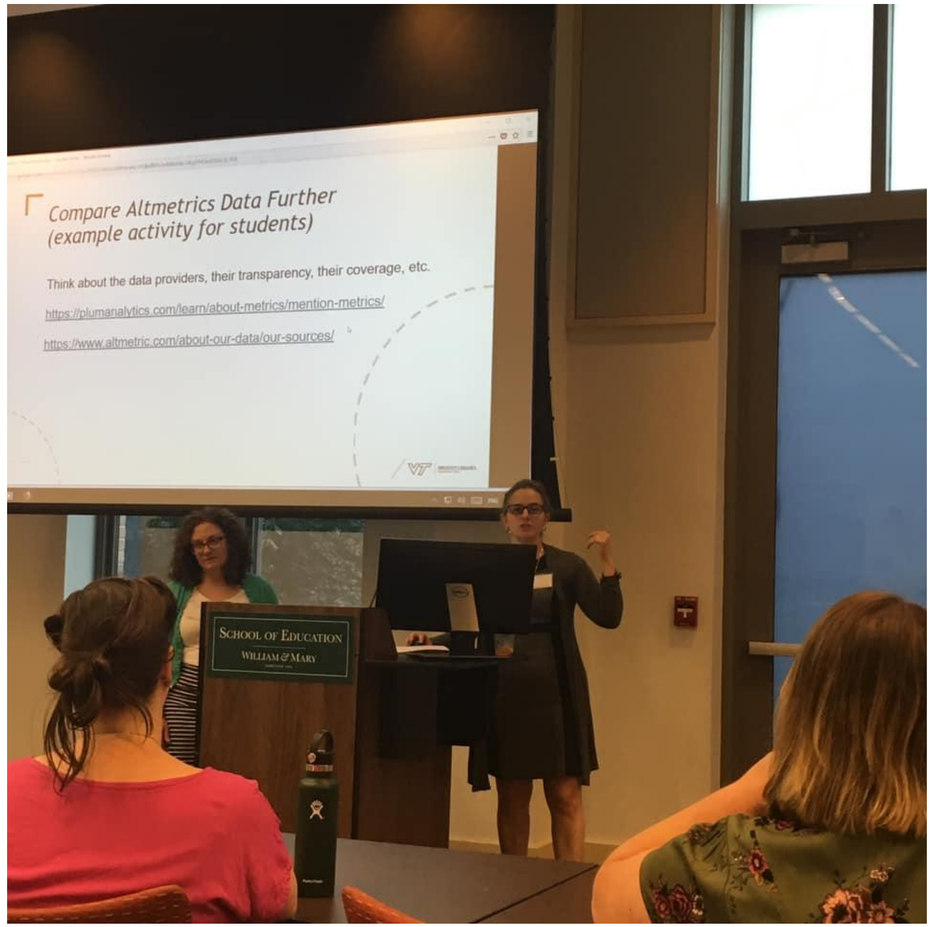
Notes on Introductions

- Amanda MacDonald
  - Undergraduate Research Services Librarian at Virginia Tech
  - Affiliate faculty member at Virginia Tech's Honors College
    - In this role Amanda has been using altmetrics in her undergraduate research methods classroom, which she'll use as today's example.
- Rachel Miles
  - Research Impact Librarian at Virginia Tech
    - Assist faculty and researchers with maintaining and linking online profiles, scholarly communication and promotion, social media, Kudos, etc.
    - Also help administrators with obtaining bibliometric and altmetric data, analyzing and interpreting the data, and visualizing the data with network tools such as VOSviewer.
    - On a more advocating role, she has been active in Faculty Senate doing survey research and making recommendations for responsible research evaluation
- You may wonder -- how did these two come together?

How Amanda & Rachel Joined Forces

- Rachel realized altmetrics could be used to discover more context around research outputs and to understand them in layperson's terms (via news articles, blogs, etc.).
- She shared her insight with Amanda, and Amanda began using altmetrics in the classroom with undergraduate students.
- Read more about this story at http://www.altmetricsconference.com/blog/metrics-beyond-impact-new-approaches-for-the-novice-researcher/

Engage in the Scholarly Conversation



Presenting at the 2019 The Innovative Library Classroom (TILC) Conference
Image by Brooke Taxakis

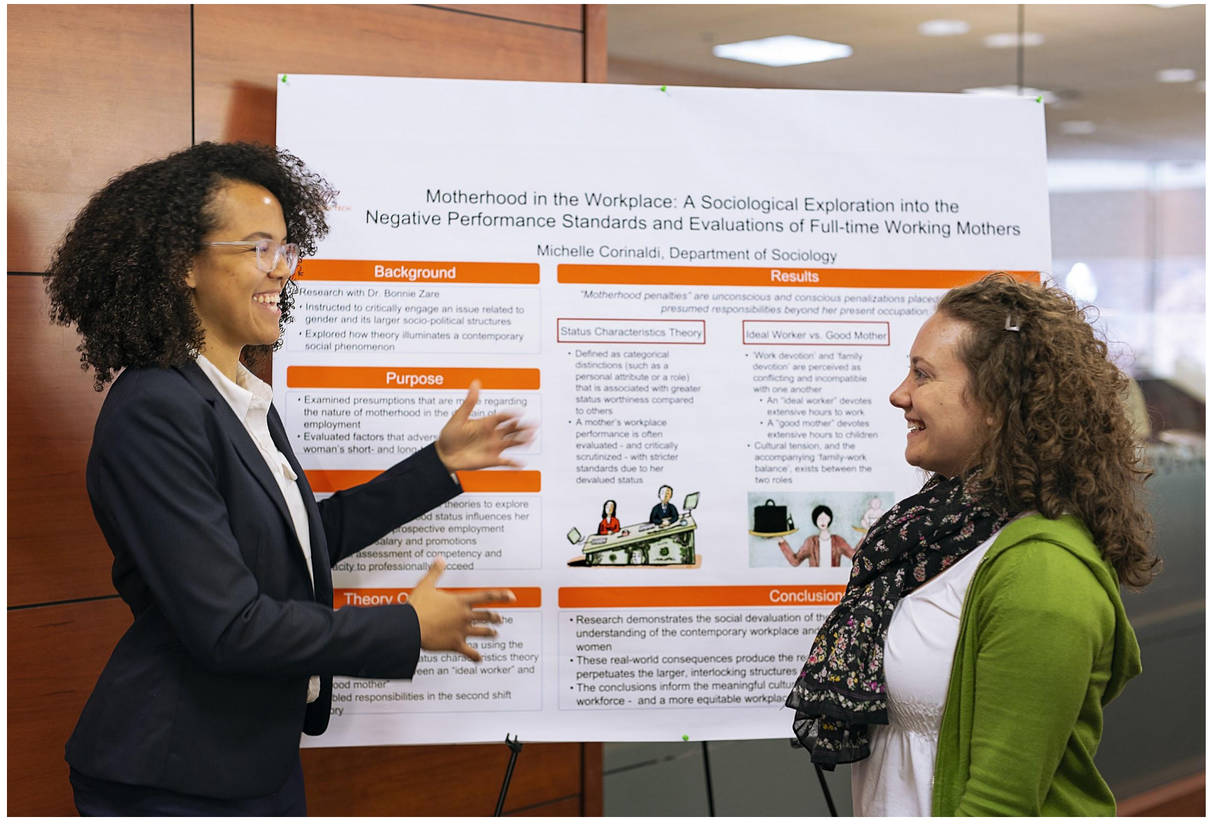


Image by Virginia Tech University Libraries

Notes on the "Engage in Scholarly Conversation" slide

As faculty members at a research institution, we as scholars are expected to engage in the scholarly conversation -- and we're expected to prepare our students how to do this as well. We have seen an increased emphasis on high-impact practices, such as undergraduate research, at Virginia Tech. And, we really want our students to be prepared for the next step after college, which may be graduate school.

Those who teach research literacy skills have the opportunity to imbue a sense of independence and competence in students unfamiliar with the scholarly conversation. Again, with the hope that they'll carry these skills with them after college. Healthy skepticism, curiosity, exploration, vetting of sources, emotional self-awareness, and a general understanding of human behavior are lifelong research skills that are constantly being honed, reassessed, and developed.

Traditional Library Instruction

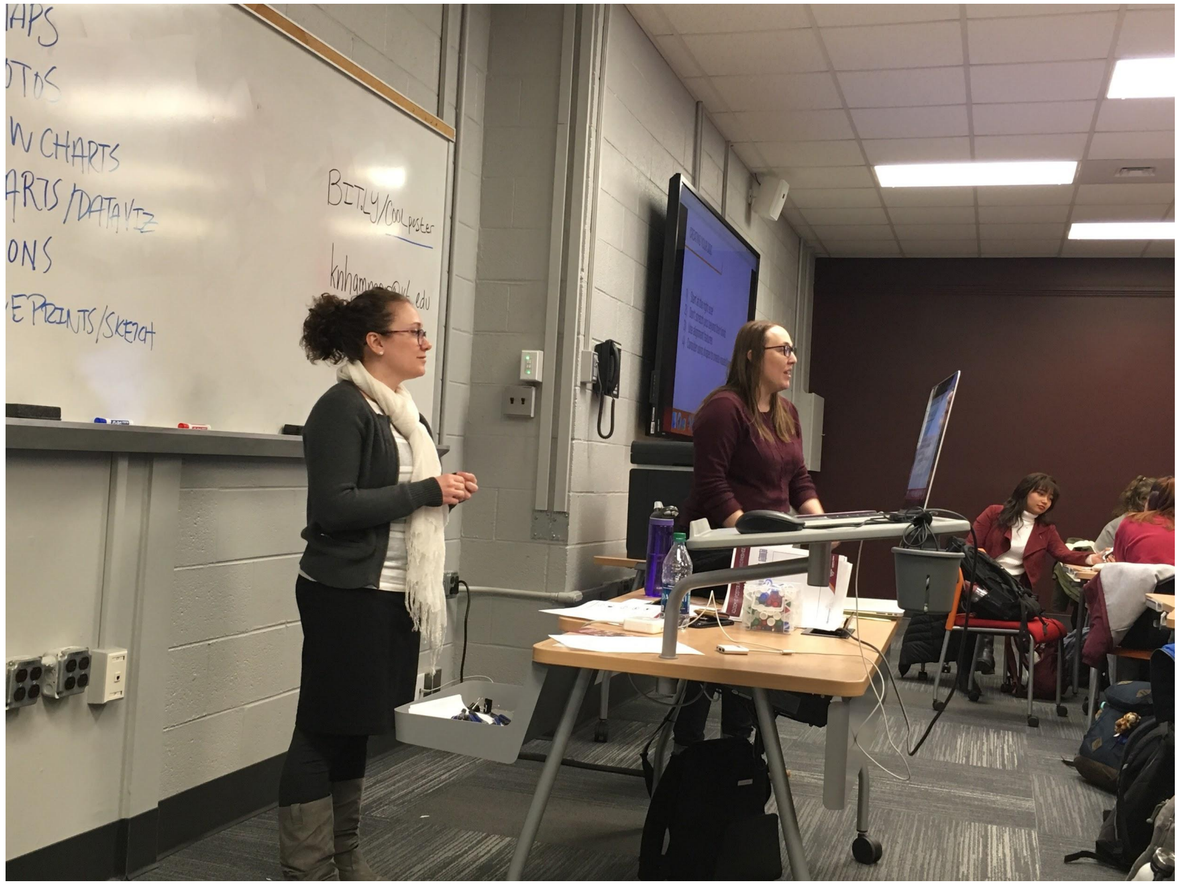


Image by Lanie Eppers

- Generating keywords
- Using Boolean operators
- Searching databases
- Citing sources

Notes on “Traditional Library Instruction” Slide

Traditional library instruction often focuses on digital and information literacy skills through keyword development, use of Boolean operators, database navigation, and proper citing of sources but rarely covers concepts related to citation metrics or altmetrics, especially in the undergraduate classroom. Unconventional and innovative approaches to library instruction show students that research is not a profession; it is a life skill.

Proposal

We propose that librarians can offer a more analytical and critical approach to their research instruction sessions by helping students, even undergraduates, interpret and decipher the meaning and context behind the metrics. And, this new approach can be directly linked to the *ACRL Framework*.

Notes on “Proposal” Slide

Our goal for this presentation is that you’ll go back to your home institutions and collaborate with instruction librarians or trainers -- use these materials -- or make your own -- and continue this effort to prepare students -- even undergraduates -- how to locate, interpret, decipher, and use metrics associated with research outputs.

Today's Outcomes

1. Describe their approach for planning active learning instructional experiences for students utilizing altmetrics
2. Engage participants in an active learning exercise on research outputs that can be adapted and replicated for instruction in undergraduate courses of any discipline
3. Prompt participants to plan a lesson for undergraduate students using altmetrics that they could employ at their home institutions

Agenda

1. Discuss how to plan active learning experiences using metrics
2. Practice activities using metrics
3. Plan an instruction session utilizing metrics that you can use at home institution/work environment

Part 1: How to plan active learning experiences using metrics

Theoretical framework behind this approach

Kolb's Cycle of Experiential Learning

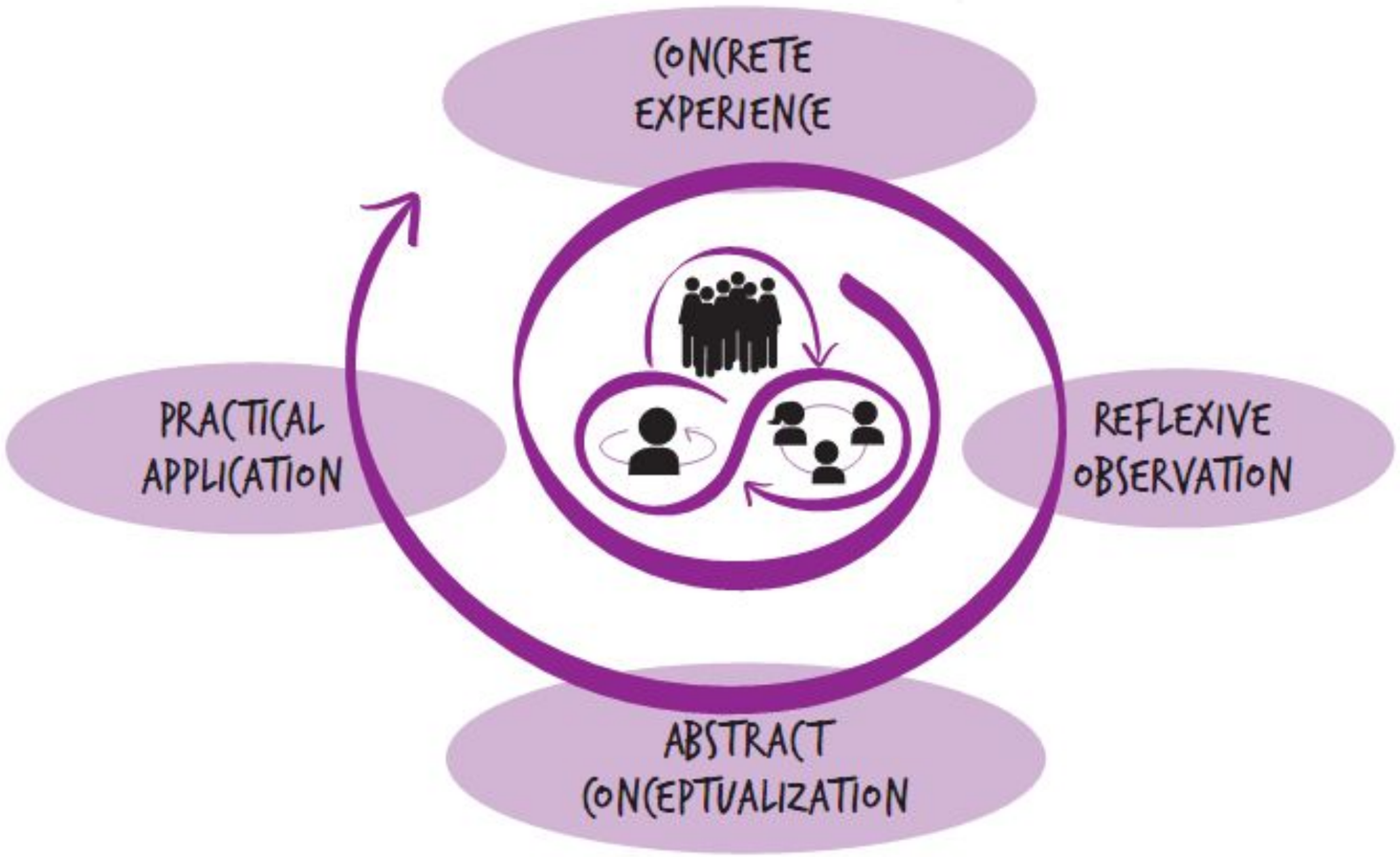


Image retrieved from http://www.mspguide.org/tool/experiential-learning-cycle

Notes on “Theoretical framework behind this approach” Slide

Before planning any sesion, Amanda decides pedagogically how she wants the session to go. Theory grounds her approach, from outcome through assessment, she ensures that the lesson aligns with pedagogy and theory.

All parts of today’s session - the workshop itself and the example session, align with this theory.

Syllabus for Library Instruction

Course Description:
This course is designed for students that are interested in conducting undergraduate research or in developing and practicing research methods. You can expect to work with students from a variety of majors across campus and learn interdisciplinary collaboration skills desired by employers and lab managers alike. Undergraduate research is often perceived to be most useful for those in STEM fields; however, this course will highlight the value of research skills and strategies used by those in arts, humanities, social sciences, engineering, and sciences. As a student enrolled in this course, you will be exposed to a community of practice where you will learn the process of designing and executing a research project of your own interests. This course is centered on the completion of a final group project (proposal and digital poster), which will aid in developing both your research and collaboration skills for future endeavors. After taking this course, you will have developed skills to execute research projects, learn more about on-campus opportunities, and practice professional skills like designing posters and presenting your research ideas. Additionally, this course counts as pointed towards the training category in the Undergraduate Research Excellence Program (UREP).

Learning Objectives:
By the end of this course, students will be able to:

1. Pose questions in relevant field of study and explore routes for novel inquiry
2. Identify common approaches for solving questions using scholarly resources

Notes on “Syllabus for Library Instruction” Slide

So here is a snippet of the syllabus for the undergraduate research practices course that Amanda provided information literacy instruction for.

You don’t need to worry about reading the text. This is just a visual. In this course, students worked in interdisciplinary research groups for the entire semester. They had the opportunity to select their own topic, generate a research question, and ultimately write a research proposal and design a research poster for an end-of-semester symposium.

Student Assignment 1

Research Project Topic & Question

1. Identify and broadly explain their research topic
2. Generate a preliminary research question and hypothesis

Notes on “Student Assignment 1”

The instructor shared the assignment sheet (this is a summarized version of it), but essentially these are the two parts of the assignment where Amanda could help students during library instruction.

Instead of doing keyword development, database navigation, and source citation -- what can we do as librarians? How can we help students really explore a topic and identify a relevant question based on the scholarly conversation? How can we use altmetrics with freshman students? How can we link to the framework?

Step 1

- Develop learning objects
  - Two key parts of the assignment are essentially the objectives; in this case we don’t have to redraft them

Framework for Information Literacy for Higher Education

Frames

- Authority Is Constructed and Contextual
- Information Creation as a Process
- Information Has Value
- Research as Inquiry
- Scholarship as Conversation
- Searching as Strategic Exploration

Notes on Framework for Information Literacy for Higher Education

- **Step 2**
  - Align learning outcomes for the session with the appropriate *Frame(s)*
- There are 6 Frames in total; we will touch on three frames in today's example:
  - Authority is Constructed and Contextual
  - Scholarship as Conversation
  - Research as Inquiry

Authority is Constructed and Contextual

Information resources reflect their creators' expertise and credibility, and are evaluated based on the information need and the context in which the information will be used. Authority is constructed in that various communities may recognize different types of authority. It is contextual in that the information need may help to determine the level of authority required.

Notes on “Authority is Constructed and Contextual”

- It’s about how each info source reflects its creator in terms of expertise and credibility
- It’s recognizing that how we evaluate the source could vary based on our info need
- It’s also noting that different communities can recognize different types of authority
- We see this frame as the **umbrella for our approach**.
    - Students need to consider context and authority for all of the concepts they planned to cover.
    - Teaching students how to contextualize discussions is an important strategy for undergraduate students to investigate differing viewpoints and lenses through which research is being communicated by specific communities and audiences.
    - In this case, altmetrics is a tool that allows students to more easily navigate between these discussions.

Scholarship as Conversation

Communities of scholars, researchers, or professionals engage in sustained discourse with new insights and discoveries occurring over time as a result of varied perspectives and interpretations.

Notes on “Scholarship as Conversation”

- Scholarship as conversation is a term that describes the scholarship produced on a particular topic by members of various communities.
- Teaching students about the scholarly conversation helps them to understand that they too can contribute to a discussion in their field or even on a topic they care about.
    - But first they have to be able to find those discussions and know what is being said or not said about a particular topic.
    - That way, they can figure out how to make a new contribution, e.g., finding a hole in literature.

Student Assignment 2

Research Project Topic & Question

1. Identify and broadly explain their research topic [Scholarship as Conversation]
2. Generate a preliminary research question and hypothesis

Notes on “Student Assignment 2”

- Scholarship as conversation can be linked to our first outcome
  - Identify and broadly explain their research topic
  - i.e., we are asking students to find and explain what’s being said and where is it being said about their topic

Research as Inquiry

Research is iterative and depends upon asking increasingly complex or new questions whose answers in turn develop additional questions or lines of inquiry in any field.

Notes on “Research as Inquiry”

- Research as Inquiry is about the iterative aspects of the research process where students are continually learning more about their potential topics, all the while asking additional questions related to their research
- When students research authentic topics -- those topics that they’re genuinely interested in -- this frame is really about that curiosity that we want to inspire in them during the research process.

Student Assignment 3

1. Research Project Topic & Question:
   a. Identify and broadly explain their research topic [Scholarship as Conversation]
   b. Generate a preliminary research question and hypothesis [Research as Inquiry]

Notes on “Student Assignment 3”

- “Research as Inquiry” can be linked to our second outcome
  - Generate a preliminary research question and hypothesis
- Because we are asking students to figure out the scholarly conversation based on what research they have found, they will begin to ask:
  - What is it that they really want to know about their topic?
  - What are scholars arguing? Exploring?

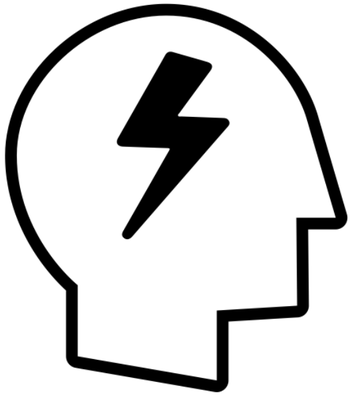
Lesson Plan for Using Metrics

- Brainstorm potential topics
- Search Altmetric Explorer to locate the scholarly conversations surrounding potential topics
- Reflect on potential topics; select one
- Iterative searching and questioning

Notes on
“Lesson Plan for Using Metrics”

- Amanda used the subscription database Altmetric Explorer in this class session/example
- But, you can use alternative free tools, such as the Altmetric Bookmarklet and the Dimensions database (which integrates Altmetric data). Another alternative is the PlumX details, which can be accessed by copy/pasting the DOI to the end of this URL: **https://plu.mx/plum/a/?doi=**
    - What is left out of here is the lecture/demo portion about what metrics are -- how to search in the database -- interpret the number -- etc
- Kolb’s cycle of experiential learning
    - Abstract conceptualization
    - Practical application via the brainstorming activity
        - What is it that the student really wants to know or research?
    - Concrete experience via searching the database
    - Reflective observation via reflection on topics

Brainstorming session



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Created by Jessica Lock
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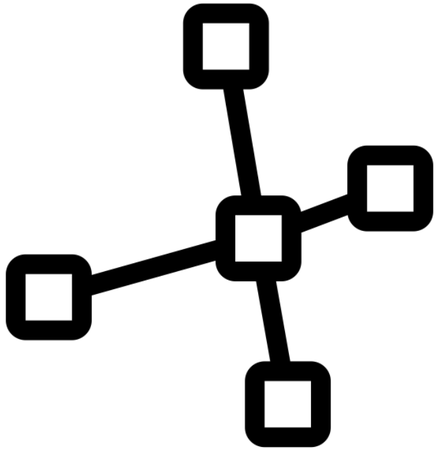

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Notes on “Brainstorming session”

- Build in time in the beginning of sessions to allow students time to consider what they might like to research
    - This could be an individual thing; perhaps you’re asking the student to free write
    - It could be a handout where students generate a concept map based on their ideas and what they know about them
    - It could be a group activity where they discuss ideas with others
- How you ask students this can vary, but as a prompt let’s get at the following:
    - Make a list of any topic(s), issue(s), question(s) you might like to explore this semester.
    - Next, write down everything you currently know about each potential topic. This doesn’t have to be complete sentences, you can just down words or phrases. Whatever works best for you.
- Amanda: “The reason I like students to write what they know is that I want them to see later what ideas (potential biases they had) when they started this process. Ideally we want them to explore different voices. We want them to get outside of their own echo chambers “

Search Altmetric Explorer to locate the scholarly conversations surrounding potential topics

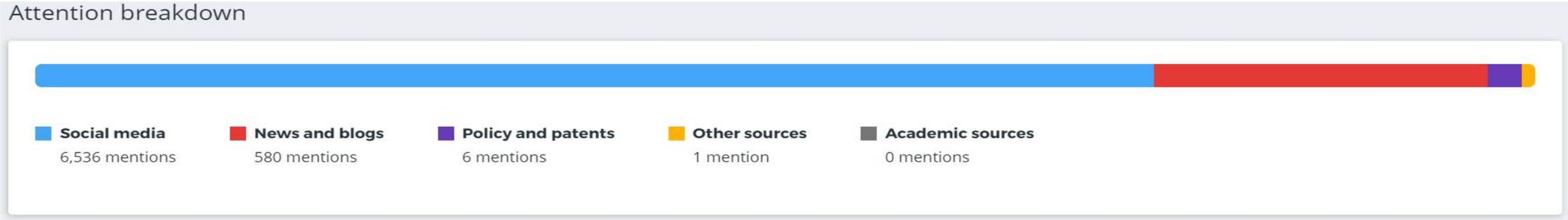
Take the next 10 minutes to search Altmetrics for your topic

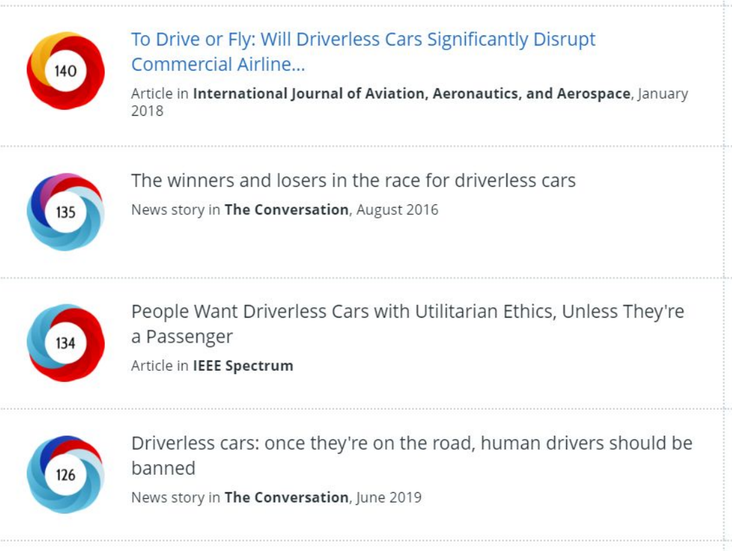
- Are there any news releases on it
- Skim through and see what you find
- Jot down 2-3 articles related to topic(s) that interest you

Notes on “Search Altmetric Explorer to locate…”

- Now that students have thought about some potential topics, which you’re not locked into, let’s think about what we can do next in order to know if any of the topics we have could work.
    - Are people in your field, especially experts in your field (or any field) talking about any of the topics or issues you noted? One way to find out is to search.
- Amanda: “I usually provide a structure for what I want students to do, how long they have, and what success looks like (meaning what I expect them to complete in that amount of time (basically, show them a finished example).”
- In class activity,
    - Take the next 10 minutes to search for altmetrics on your topic
    - Are there any news releases on it?
    - Skim through and see what you find
    - Jot down 2-3 articles related to topic(s) that interest you

Discuss the Altmetric Explorer (AE) search results with students





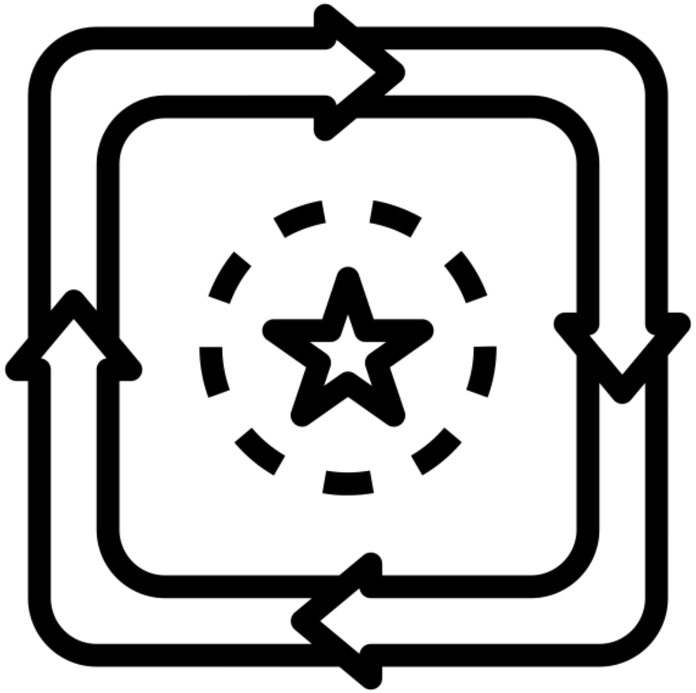
Notes on “Discuss the AE search results with students”

- Point out to students that the info they’re finding (e.g., the results from their searches in AE), that this is the “scholarly conversation,” and that their ultimate goal is to be one of these contributors, though this might not happen during this course. This is what we’re training them to do: be researchers
- What is being cited the most? What does the color of the Altmetric Attention Donut mean? What can they perhaps discover through these articles?
  - So it’s about the metrics and what is getting noticed a lot, but also about fundamentally understanding contributing as a researcher
- Also note the results are from multiple publications on AE (doing a keyword search). It’s good to encourage them to read a variety of news outlets; again it gives them a chance to consider other perspectives.

Reflect on potential topics; select one

Now that you've done a basic search on all of your topic ideas, which topic stood out to you? What is being said about it? Are there questions/thoughts you have that aren't being discussed but should be?

Iterative searching and questioning



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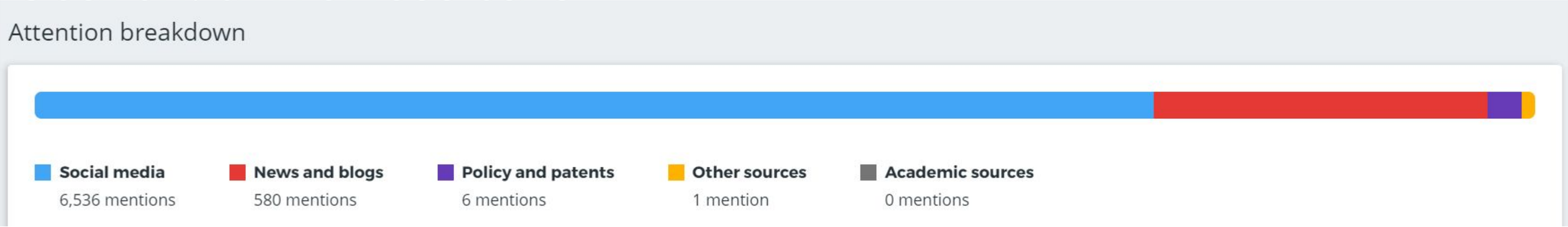
from Noun Project

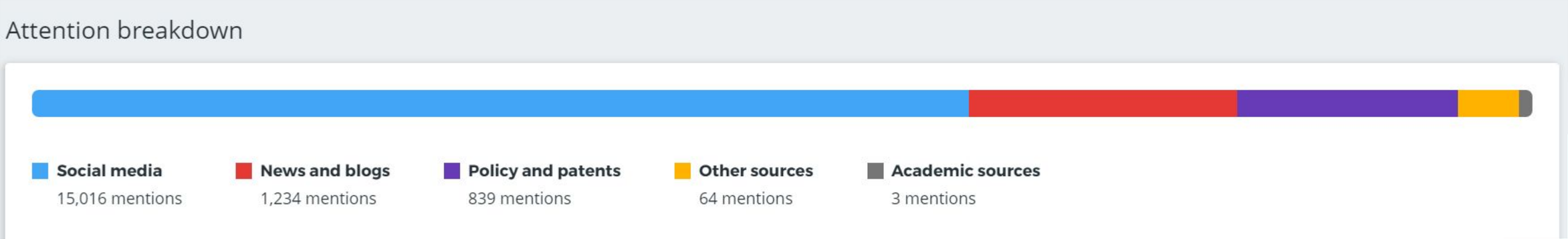
Note: Encourage students to maintain an open mind as they seek answers to their research questions, brainstorm, note results found in Altmetric Explorer or Dimensions, and generate new questions. This is also a good time to encourage them to seek information from multiple perspectives and a reminder that authority and context always come into play.

Keyword discussion

Search: driverless cars



Search: autonomous vehicles



- As students continually work on changing their search -- their results can change too -- this time can double as a conversation on keywords and how they can influence your results
- This is all part of the iterative search process

What do students leave with?

- Identified and explored the scholarly conversation
- Generated topics and questions that interest them
- Searched for “answers”
- Noted their own biases from the start
  - Intentional focus on looking for other voices
- Explored metrics and considered what the attention means

What are other activities you can do with students?

In-class examples:

- Practice evaluating sources and exploring research ethics
  - http://dx.doi.org/10.1056/nejmoa1200303
- Learn more about a seminal work
  - dx.doi.org/10.1126/science.1070821

Notes on “What are other activities you can do with students?” (1 of 2)

- Another option: select research outputs to use as examples for students to allow them to explore and consider that output more in relationship to metrics
- For upper level undergraduates altmetrics can help with understanding seminal works and evaluating sources
- **Example 1: Understanding Seminal Works**
  - What does it mean for a piece to be a seminal work?
    - Why is it seminal?
    - How can exploring a seminal work inform what I choose to read once I’m conducting a literature review?
  - Look up dx.doi.org/10.1126/science.1070821 in Altmetric Explorer
    - Altmetric score is low
    - Citation metric here is quite high
      - Article is still being cited 16 years later
    - Seminal works are often groundbreaking in some way for fields and have longer citation lifespans
    - Altmetrics occur immediately following publication, but older works didn’t really follow the same standards during publication. In terms of DOIs, linking/URLs, etc., we just don’t have the altmetrics that it would have say 20 or 30 years from now if it were published today
    - Using the altmetrics alongside bibliometrics (citation metrics) can help paint a clearer picture about the significance of a piece
    - High citations - even 15-20 years later - and inspiring even the creation of works in other types of mediums - students should be able to see the significance of this when exploring the metrics

Notes on “What are other activities you can do with students?” (2 of 2)

- **Example 2: Evaluating Sources**
  - Students of all levels seem to struggle with evaluating sources
  - In particular, if doing research on current issues or controversial topics, how do I know that what I am looking at has the merit to deserve the attention and my research time, i.e., how do I separate substance from spin?
  - Altmetric Explorer tracks Retraction Watch as a blog, so if something has been retracted, students can find out if a retraction was made and the conversations surrounding the retraction when they dive into the context of the attention for an individual output.
  - Here is an example of an article that was retracted because the authors didn’t disclose some important details about the control group
    - http://dx.doi.org/10.1056/nejmoa1200303
    - They were invited to submit a revised version of the article, which is very rare, but since the article was so popular, they wanted to see what the data really said.
    - The data shows the same thing but the data could not be generalized to the general population
      - A mediterranean diet is still good for you and in general can prevent heart attack and stroke in your later years
    - All this out from one of the news articles on the topic, and so overall, this journal article's results were still supported despite the generalizability issue.
    - Students seeing real life examples like this can help them understand the research process better as well as the research itself. News articles that discuss research results make research more digestible for undergraduates, especially first and second year students, though their limitations can be discussed as students become more advanced (e.g., stories that sensationalize results).

Part 2: Practice activities using metrics

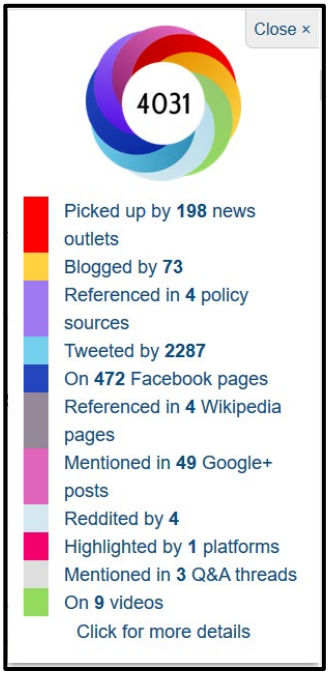
Note on “Part 2: Practice activities using metrics”

In this part of the workshop, we have **source cards** that feature different research outputs and examples/activities you could use with your attendees/students at instruction sessions.

Source Cards Activity

- Download metrics source cards at https://bit.ly/metrics-source-cards
- Divide into 4 groups
- Each group will receive 1 source card and 1 activity sheet (activities included in slides)
- Take 8 minutes to review the source card and complete the activity
- Each group will have 2 minutes to share with us what the activity was and what they found when completing it

Source Card 1:
“Primary prevention of cardiovascular disease with a Mediterranean diet”



CITATION:

Estruch, R., Ros, E., Salas-Salvadó, J., Covas, M.-I., Corella, D., Arós, F., … Martínez-González, M. A. (2013). Primary prevention of cardiovascular disease with a Mediterranean diet. *New England Journal of Medicine*, *368*(14), 1279–1290. https://doi.org/10.1056/NEJMoa1200303

ALTMETRIC ATTENTION SCORE: 4,031

SCHOLARLY CITATION COUNTS:

MICROSOFT ACADEMIC: 3,991

LENS.ORG: 2,788

DIMENSIONS: 2,596

SCOPUS: 2,533

WEB OF SCIENCE: 2,268

CORRECTION: "Primary Prevention of Cardiovascular Disease with a Mediterranean Diet (Original Article, N Engl J Med 2013;368:1279-1290). In Table 1 (page 1281), in the Goal column, the recommended number of servings of vegetables for the low-fat diet should have been "≥2 servings/day," rather than "≥2 servings/wk." The article is correct at NEJM.org." **DATE OF CORRECTION:** 27 February 2014

SELECT NEWS ARTICLE TITLES:

"Mediterranean Diet Can Help Reduce Risk of Gestational Diabetes." *Healthline.* 30 July 2019.

"This Mediterranean diet study was hugely impactful. The science has fallen apart." *Vox.* 13 February 2019.

"Mediterranean Diet Linked to 25 Percent Lower Risk of Heart Disease." *Medical Health News.* 12 Dec 2018.

"Confused by the latest dietary advice? Here's why not to be." *The Guardian*. 14 September 2018.

"Spanish Test: Mediterranean Diet Shines In Clinical Study." *NPR*. 25 February 2013.

"Errors Trigger Retraction Of Study On Mediterranean Diet's Heart Benefits." *NPR.* 13 June 2013.

"Mediterranean Diet Tied to Lowered Stroke Risk for Women." *MedPage Today*. 20 September 2018.

CONTEXT TO MENTION: This article focuses more on another study out of Great Britain as it relates to following the Mediterranean diet to reduce risk of stroke in women. At the end of the article, it mentions the publication from 2013:

> "A Mediterranean diet is recommended in the U.S. (original article) for stroke prevention, based in part on clinical trials like PREDIMED. That trial was retracted and republished (updated article) this year, but its findings remained largely the same."

BLOGS TAB – RETRACTION WATCH: "Does the Mediterranean diet prevent heart attacks? NEJM retracts (and replaces) high-profile paper." 13 June 2013. **CONTEXT:** Links to *NPR* article about the details of the errors in the study.

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REVISED ARTICLE: Estruch, et al. (2018). Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts. *New England Journal of Medicine*, *378*(25).

FROM REVISED ARTICLE ABSTRACT: "We have withdrawn our previously published report and now report revised effect estimates based on analyses that do not rely exclusively on the assumption that all the participants were randomly assigned. [. . .] Results were similar after the omission of 1588 participants whose study-group assignments were known or suspected to have departed from the protocol."

REVISED ARTICLE ALTMETRIC ATTENTION SCORE: 1,523

SELECT NEWS ARTICLE TITLES:

"Mediterranean diet during pregnancy may lower gestational diabetes risk: Study." *The Tribune India. The Indian Express. EurekAlert! Yahoo Finance.* [9 Local News sources]. 24 July 2018.

"This Mediterranean diet study was hugely impactful. The science has fallen apart." *Vox.* 13 February 2019.

"Mediterranean Diet Study Walks Back Strongest Claim. Here's What Researchers Got Wrong." *Fortune.* 14 June 2018.

MENTION CONTEXT: "The new conclusion: People in the study [. . .] had fewer strokes and heart attacks than those who weren't put on such a diet. However, the study no longer says this applies generally to reducing such risk for this class of people—it's applicable to participants but not more broadly without additional research."

DIMENSIONS CITATIONS: 262

SELECTED CITATIONS:

1. Fernandes, J., Fialho, M., Santos, R., Peixoto-Plácido, C., Madeira, T., Sousa-Santos, N., … Carneiro, A. V. (2020). Is olive oil good for you? A systematic review and meta-analysis on anti-inflammatory benefits from regular dietary intake. *Nutrition*, *69*, 110559. https://doi.org/10.1016/j.nut.2019.110559
2. Khalatbari-Soltani, S., Imamura, F., Brage, S., De Lucia Rolfe, E., Griffin, S. J., Wareham, N. J., … Forouhi, N. G. (2019). The association between adherence to the Mediterranean diet and hepatic steatosis: Cross-sectional analysis of two independent studies, the UK Fenland Study and the Swiss CoLaus Study. BMC Medicine, 17(1), 19. https://doi.org/10.1186/s12916-019-1251-7

CONTEXT TO CITATIONS:

1. "Moreover, we also excluded studies in which it was difficult to isolate the real effect of olive oil intervention due to the inclusion of foods that could mask the results (e.g., diet intervention with olive oil and nuts, as the latter by itself may contribute to the anti-inflammatory effect)" [55].
2. Two cross-sectional studies reported conflicting results: one among obese Spanish adults with high cardiovascular risk ($n = 794$) reported an inverse association [18], and the other among apparently healthy Chinese adults ($n = 332$) reported a null association [19].

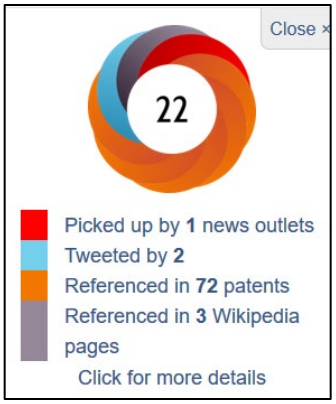
Activity & Questions for "Source Card 1"

Activity: Source Evaluation using Altmetric Explorer

Consider the answers to the following questions:

1. What do the **Altmetric Attention Score** and **Dimensions Citation Count** tell us about this source?
2. Review the **Select News Articles** from side A of your source card. What do these news articles reveal about this study?
3. What do we learn about this article from the **Blog Tab - Retraction Watch**?
4. What does the **From Revised Article Abstract** tell us about research ethics and the research/writing process?
5. Is there **any other context** from the source card that influences your assessment or judgment of the research output?

Source Card 2: “Self-Assembly at All Scales”



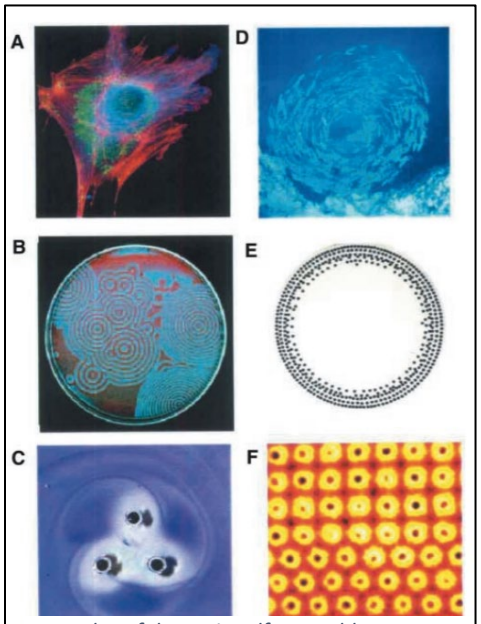
CITATION:

Whitesides, G. M., & Grzybowski, B. A. (2002). Self-assembly at all scales. *Science*, *295*(5564), 2418-2421. https://doi.org/10.1126/science.1070821

DOCUMENT TYPE: "Special viewpoint" (publisher's classification); "review" (Scopus classification)

ABSTRACT:

Self-assembly is the autonomous organization of components into patterns or structures without human intervention. Self-assembling processes are common throughout nature and technology. They involve components from the molecular (crystals) to the planetary (weather systems) scale and many different kinds of interactions. The concept of self-assembly is used increasingly in many disciplines, with a different flavor and emphasis in each.



Examples of dynamic self-assembly
Images derived from source article, p. 2420

ALTMETRIC ATTENTION SCORE: 22

NEWS ARTICLE TITLE:

"Shape-encoded dynamic assembly of mobile micromachines." *Phys.org.* 15 July 2019.

CONTEXT TO NEWS MENTION:

"A micromachine can be composed of multiple parts, materials or chemistries **to address multiple functions**, including actuation, sensing, transport and delivery."

WIKIPEDIA PAGES:

Hexahydroxytriphenylene, **Two-dimensional polymer (context)**, Self-assembly

WIKIPEDIA MENTION CONTEXT: "Molecular self-assembly involves the association by many weak, reversible interactions to obtain a final structure that represents a thermodynamic minimum."[citation to article]

PATENT CITATIONS:

ALTMETRIC: 72, *data sources: IFI Claims, which tracks nine international patents offices in 98 countries*

LENS.ORG: 94, *data sources: ingested from public sources, which tracks seven international patent sources and >100 countries*

CONTEXT: Citations to this work come from three jurisdictions, 87 from the U.S., 4 from the European Union, and 3 from WIPO.

SELECT PATENT CITATIONS (LENS.ORG):

Fabrication Of Complex Three-Dimensional Structures Based On Directed Assembly Of Self-Assembling Materials On Activated Two-Dimensional Templates. US Patent No. 8168284 B2, May 1, 2012. Retrieved from https://lens.org/084-061-274-540-087

Apparatus With Light Emitting Or Absorbing Diodes. US Patent No. 9018833 B2, April 28, 2015. Retrieved from https://lens.org/006-555-204-689-776

SCHOLARLY CITATIONS COUNTS:

MICROSOFT ACADEMIC: 6,479

GOOGLE SCHOLAR: 6,375

SCOPUS: 4,745

WEB OF SCIENCE (CLARIVATE): 4,574

LENS.ORG: 4,469

DIMENSIONS: 4,098

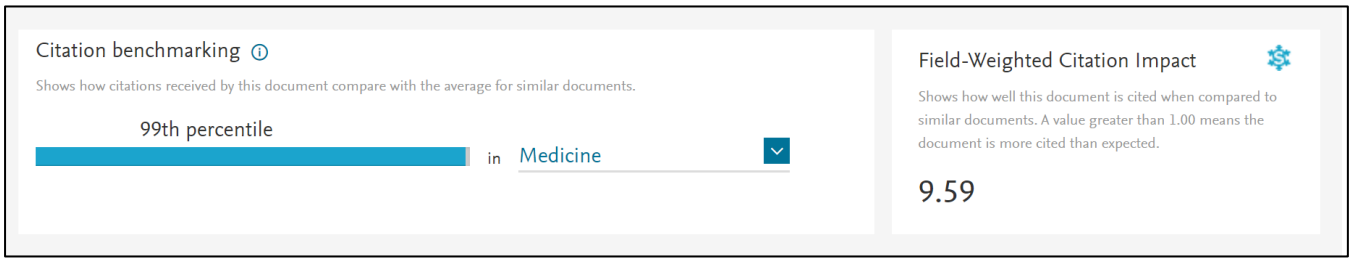
FIELD-WEIGHTED CITATION INDICATORS

These indicators are the ratio of citations received by a publication and the average number of citations received by similar publications, which is usually based on three factors: field, year of publication, and document type (e.g., research article, review article, editorial, etc.). However, Dimensions **does not** include a '**document type**' field in its database and is only calculated based on the average number of citations in a given field and the year of publication.

SCOPUS

FIELD-WEIGHTED CITATION IMPACT (FWCI): 9.60

CITATION BENCHMARKING: 99th percentile in Medicine



Benchmarking and FWCI from Scopus

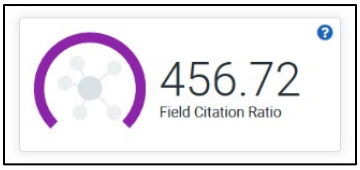
INCITES / CLARIVATE ANALYTICS:

CATEGORY NORMALIZED CITATION IMPACT (CNCI): 53.63

PERCENTILE IN SUBJECT AREA: 98TH

DIMENSIONS

FIELD CITATION RATIO (FCR): 456.72



FCR from Dimensions

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Activity & Questions for "Source Card 2"

Activity: Understanding Seminal Works Using Altmetrics

Consider the answers to the following questions:

1. What do the **Altmetric Attention Score** and **Dimensions Citation Count** tell us about this source?
2. Review the **Select News Articles** from side A of your source card. What do these news articles reveal about this study?
3. What year was this source published? What other kinds of outputs cite this source?
4. Why would a source like this, published several years ago, still be widely cited?

Source Card 3: “Global Risk of Deadly Heat”

CITATION:

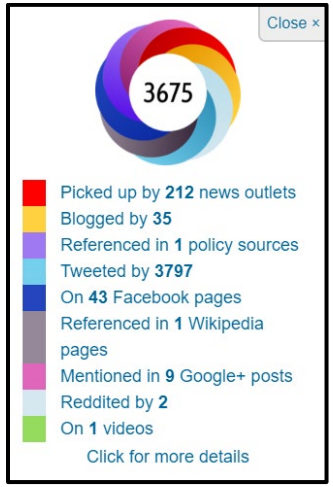
Mora, C., Dousset, B., Caldwell, I. R., Powell, F. E., Geronimo, R. C., Bielecki, C. R., ... & Lucas, M. P. (2017). Global risk of deadly heat. *Nature Climate Change*, *7*(7), 501. https://doi.org/10.1038/nclimate3322

DOCUMENT TYPE: Review article

COMPARISON OF ALTMETRICS DATA SOURCES – ALTMETRIC AND PLUM ANALYTICS

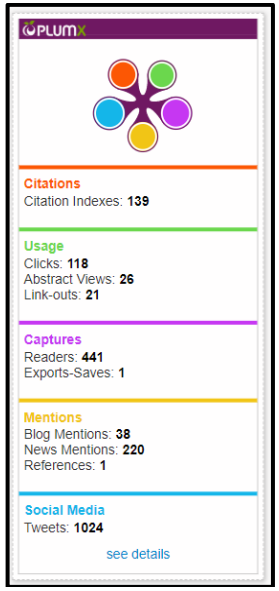
ALTMETRIC ATTENTION SCORE:
3,675
DETAILS:

- 289 news stories
- 5 policy documents
- 35 blogs
- 3797 Tweeters
- 154 citations (Dimensions)
- 43 Facebook users
- 1 Wikipedia page
- 2 Redditors
- 1 video uploader
- Geographical, demographic breakdowns for Twitter and Mendeley readership available, but the majority is unknown.



PLUMX METRICS DETAILS

- 220 news mentions
- 0 policy documents
- 38 blogs
- 1024 tweets
- Citations:
  139 (Scopus)
  98 (CrossRef)
- 1 Wikipedia reference
- 0 video uploaders
- Usage Data:
  - 118 Clicks (Bitly)
  - 26 Abstract views (EBSCO)
  - 21 Link-outs (EBSCO)



SELECT NEWS ARTICLE TITLES:

"This week's heat wave in Europe is a preview of what the climate crisis has in store." *Fox 40. KTVZ.* 24 June 2019.

"A massive heat wave is sweeping the US. Here's how extreme summer heat affects your body and brain." *Business Insider.* 19 July 2019.

"Bitcoin could theoretically pub Paris climate goals out of reach – Tech News." *The Star Online. MSN.* 29 October 2019.

"Oppression is the Greatest Determinant of Deadly Heat." *Common Dreams.* 26 May 2018.

"You, Yes You, Should Join a Lawsuit Arguing for Climate Justice." *Slate Magazine.* 15 November 2017.

"Every Other Summer Will Shatter Heat Records Within a Decade." *Vice.* 1 November 2017.

SCHOLARLY CITATION COUNTS

GOOGLE SCHOLAR: 226

MICROSOFT ACADEMIC: 221

LENS.ORG: 155

DIMENSIONS: 154

SCOPUS: 139

WEB OF SCIENCE (CLARIVATE ANALYTICS): 125

FIELD NORMALIZED CITATION INDICATORS

These indicators are the ratio of citations received by a publication and the average number of citations received by similar publications, which is usually based on three factors: field, year of publication, and document type (e.g., research article, review article, editorial, etc.). However, Dimensions does not include 'document type' in its database and is only calculated based on the average number of citations in a given field and the year of publication.

DIMENSIONS

FIELD CITATION RATIO: 57.26

SCOPUS

FIELD WEIGHTED CITATION IMPACT (FWCI): 33.22

PERCENTILE IN ENVIRONMENTAL SCIENCE: 99TH

INCITES / CLARIVATE ANALYTICS

CATEGORY NORMALIZED CITATION IMPACT (CNCI): 21.78

PERCENTILE IN SUBJECT AREA: 95TH

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Activity & Questions for "Source Card 3"

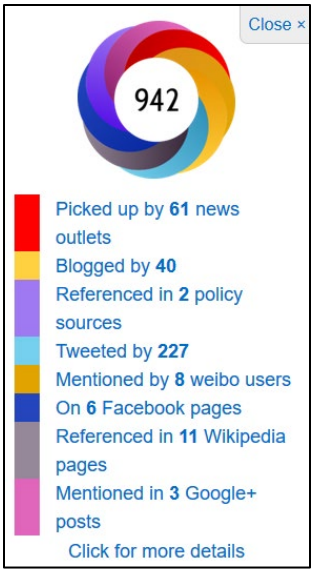
Activity: Comparing & Contrasting Metrics: What is the Data Really Saying?

1. Compare Altmetric vs. Plum Analytics Data
2. Compare and contrast the metrics of this source from Altmetric and PlumX data. What similarities/differences do you notice?
3. What type of sources are different for Almetric vs. PlumX?
4. What do the select news articles titles say about this research article?
5. What about the citation counts and field-normalized citation indicators? How do they differ? Why do you think this might be?

Source Card 4:
“The weirdest people in the world?”

CITATION:

Henrich, J., Heine, S., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*(2-3), 61-83. doi:10.1017/S0140525X0999152X



ALTMETRIC ATTENTION SCORE: 942

SELECT NEWS ARTICLE TITLES:

"The Famous Big 5 Personality Test Might Not Reveal the True You." Published in 45 local public radio outlets. 10 July 2019.

CONTEXT TO MENTION: "In fact, Norenzayan and his colleagues coined the term WEIRD in 2010. They published a **review paper** titled "The Weirdest People In the World?" to call attention to the fact that the vast majority of psychology studies are done in rich Western countries with mostly white people. [. . .] That's why educated, middle-class and liberal people are over-represented in these [psychological Big Five] studies."

This news article also mainly focuses on the more recently published (2019) scholarly research article: "Challenges to capture the big five personality traits in non-WEIRD populations," from *Science Advances.*

"Learning about different cultures is shaking the foundations of psychology." *World Economic Forum. MedicalXpress. The Conversation.* 12 March 2018.

CONTEXT TO MENTION: "Experimental psychologists typically study behaviour in a small group of people, with the assumption that this can be generalised to the wider human population. [. . .] **More than 90% of participants** in psychological studies come from countries that are Western, Educated, Industrialised, Rich, and Democratic (W.E.I.R.D). Clearly, these countries are neither a random sample nor representative for the human population."

This news article cites 13 other news sources and research outputs.

"How East and West Think in Profoundly Different Ways." *BBC News.* 19 January 2017.

SELECT POLICY DOCUMENTS:

World happiness report 2012. Analysis & Policy Observatory (APO). 4 April 2012.

CONTEXT: "More generally, it has been argued that for a broad range of psychological findings, conclusions are based on experiments undertaken using WEIRD subjects (those from Western, Educated, Industrialized, Rich Democracies), and do not represent well what happens in the much larger populations in other countries and cultures."

From Chapter 2: The State of World Happiness, sub-section, "How can happiness be compared across individuals, nations, and cultures?"

The problem of Data. Analysis & Policy Observatory (APO). 2 August 2012.

Wikipedia pages: Social psychology, transnational feminism, Feminist psychology, Intersectionality, Etoro people, Psychology, Web-based experiments, Kaluli people, Steven Heine (psychologist), Joseph Henrich, Cultural psychology

SCHOLARLY CITATION COUNTS

GOOGLE SCHOLAR: 5,714

MICROSOFT ACADEMIC: 5,724

DIMENSIONS: 2,871

LENS.ORG: 3,455

SCOPUS: 2,921

WEB OF SCIENCE: 1,010

SELECT CITING TITLES:

"How learning to read changes the cortical networks for vision and language."

"The viability of crowdsourcing for research."

"The cultural niche: Why social learning is essential for human adaptation."

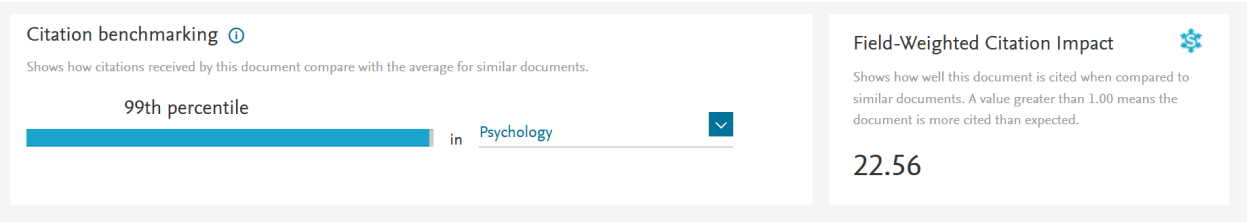
FIELD-NORMALIZED CITATION INDICATORS

These indicators are the ratio of citations received by a publication and the average number of citations received by similar publications, which is usually based on three factors: field, year of publication, and document type (e.g., research article, review article, editorial, etc.). However, Dimensions does not include 'document type' in its database and is only calculated based on the average number of citations in a given field and the year of publication.

SCOPUS

FIELD-WEIGHTED CITATION IMPACT (FWCI): 22.56

CITATION BENCHMARKING: 99th percentile in Biochemistry, Genetics and Molecular Biology; Medicine; Neuropsychology and Physiological Psychology; Neuroscience, Physiology, Psychology



Benchmarking and FWCI from Scopus

INCITES / CLARIVATE ANALYTICS

CATEGORY NORMALIZED CITATION IMPACT (CNCI): 40.4

DIMENSIONS

FIELD CITATION RATIO (FCR)*: 822.79

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Activity & Questions for "Source Card 4"

Activity: Source Evaluation using Altmetric Explorer

Consider the answers to the following questions:

1. What do the **Altmetric Attention Score** tell us about this source?
2. Review the **Select News Articles** and their select **Context to Mention** from side A of your source card. What do these news articles reveal about this study?
   a. *Hint: pay close attention to publication dates of the source and the news articles mentioning the source.*
3. What do the **Select Policy Documents** and the **Context** reveal about this study?
   a. *Hint: pay close attention to publication dates of the source and the policy documents mentioning the source.*
4. What do the Wikipedia page titles reveal about this study?
5. What do the **Scholarly Citation Counts** and their sources reveal about this study? How about the **Select Citing Titles**?
6. What do the **Field-Normalized Citation Indicators** reveal or imply?
   a. *Hint: compare the Scopus FWCI to the FCR. How similar are they? If they are different, what new questions arise for you about these metrics?*

Adapting for other contexts

You can adapt these activities when doing workshops and training for helping administrators, department heads, and other evaluators improve how they assess faculty and researchers.

For example, re-create source cards or activities to focus on authors / scholars and their outputs.

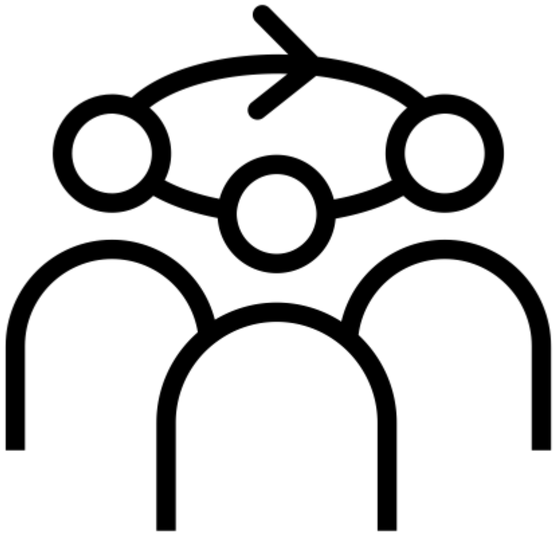
Part 3: Plan an instruction session utilizing metrics that you can use at home institution/work environment

Planning a Session Using Metrics

Using your home institution/work context, take the next few minutes to consider:

- An assignment that metrics tool and/or instruction might help students better understand/accomplish their work
  - What is that assignment? What do students need to do?
- Can any of today's activities be used? If so, how?
- If not, are there other tools or activities that you may consider using after today, even if not mentioned.

Think-Pair-Share



Take the next few minutes to discuss your plans/ideas with the person next to you.

Created by Yu luck
from Noun Project

Notes on “Think-Pair-Share” Activity

Link back to **Kolb’s Cycle of Experiential Learning**

- Abstract conceptualization
  - Part 1: example of my instruction for how to plan an experience
- Practical application
  - Part 2: source card activity
- Concrete experience
  - Part 3: planning your own instruction session
- Reflective observation
  - Part 3: think-pair-share is how you thought/reflected on what you might do

Does anyone have any ideas for a tool/metric/approach that we didn’t discuss today but you think could be useful when teaching students?

Questions, Other Ideas?