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# PARTICIPATORY INFORMATION SPACES: DESIGNING SMARTER SOCIETIES

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# RESEARCH HIGHLIGHTS

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## **Computational literacies** - computation in contexts that excite learners

- media computation (intro to computing)
- openHTML and Thimble (NSF)
- Snowball (NSF)

## **Media/information literacies** - forms of participation in online life

- science online (mediawiki extension for high schools)
  - studies of learning in wikis and social media
  - studies of Wikipedia governance
  - social search practices of teens (IMLS)
  - sensitive disclosures and support seeking online
  - family history research platforms as participatory history resources
  - designing information savvy societies (NSF CAREER)
  - measuring the value of anonymous online participation (NSF SaTC I)
  - privacy styles and algorithm avoidance (NSF SaTC II)
-

# SOCIAL COMPUTING RESEARCH GROUP @DREXEL



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Tom Park

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Museum and Library  
SERVICES



# PROBLEM

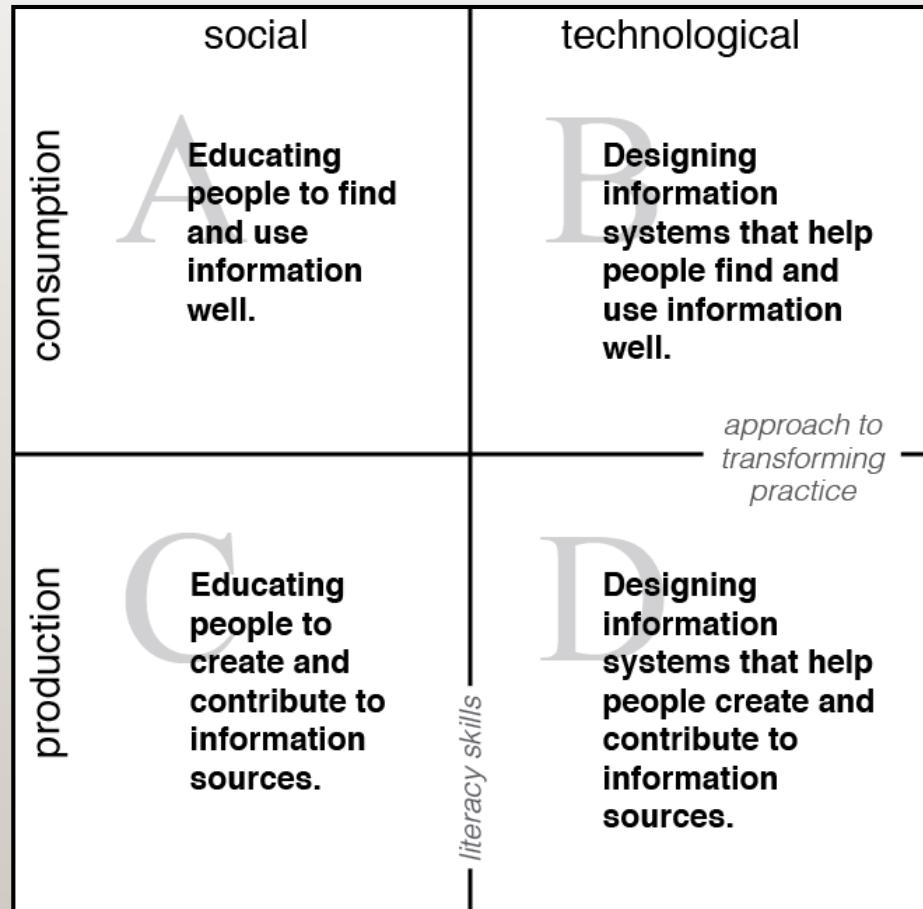
There is a lot of bad information on the Internet.

# ONE RESPONSE

Help people get better at assessing information.

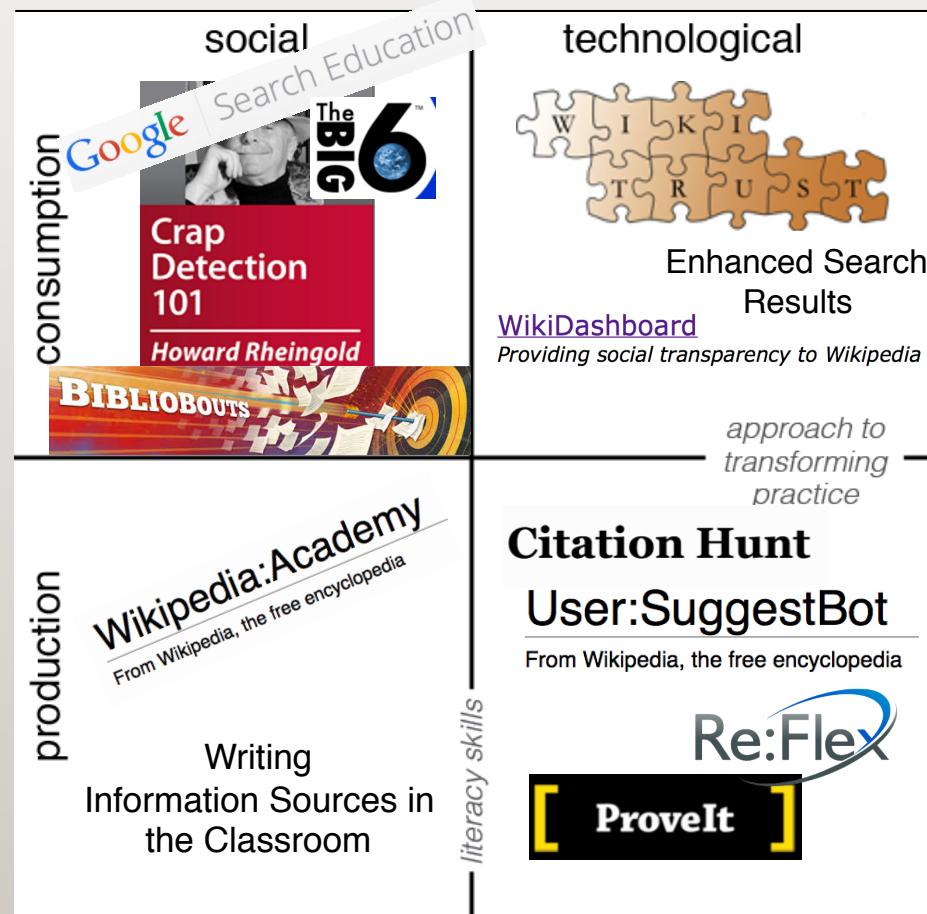
- largely taken up by education and librarianship communities in approaches to **information literacy** and **bibliographic instruction**.

# INTERDISCIPLINARY LITERACY FRAMEWORK



Forte, Andrea et al. (2014). Designing Information Savvy Societies: An Introduction to Assessability. CHI.

# INTERDISCIPLINARY LITERACY FRAMEWORK



Forte, Andrea et al. (2014). Designing Information Savvy Societies: An Introduction to Assessability. CHI.

In HCI, we design to support human needs using principled approaches.

e.g. accessibility, usability, ergonomics

# assessability

/ə'se-sə-bi-lə-tē/

noun

the extent to which an interface helps people make appropriate assessments of information quality in a particular context of use.

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# BUILDING A DESIGN VOCABULARY

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1. Strategic qualitative studies to develop an initial set of concepts that capture real-world assessment practices.
2. Design experiments that embody these concepts in interface features and test their effectiveness.



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# INTERVIEW/ DIARY STUDY

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- **20 participants:** 7-day search diary
- **12 participants:** follow-up interviews to better understand assessment practices including exploratory and scenario-based formats
- **analysis:** inductive approach to identify key assessment concepts and strategies

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# INTERVIEW/ DIARY STUDY PARTICIPANTS

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- **Wikipedians**

Experienced Wikipedians, expert producers who are not professionally trained. Recruited through Wikimedia Foundation channels.

- **Information Professionals**

Librarians, formally trained to select and assess information. Recruited locally using flyers and mailing lists.

- **Novices**

do not participate in information production and have no special training. Recruited using flyers and mailing lists.

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# INDUCTIVE ANALYSIS: CORE CONCEPTS

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## ■ Information Provenance

*Where did this information come from?*

Everyone looked at citations, but they struggled to interpret quality and the interface didn't help.

## ■ Information Stewardship

*How is this information maintained?*

Only Wikipedians were able to use their knowledge of the production system to make informed judgements about how the content was maintained and the interface didn't help.

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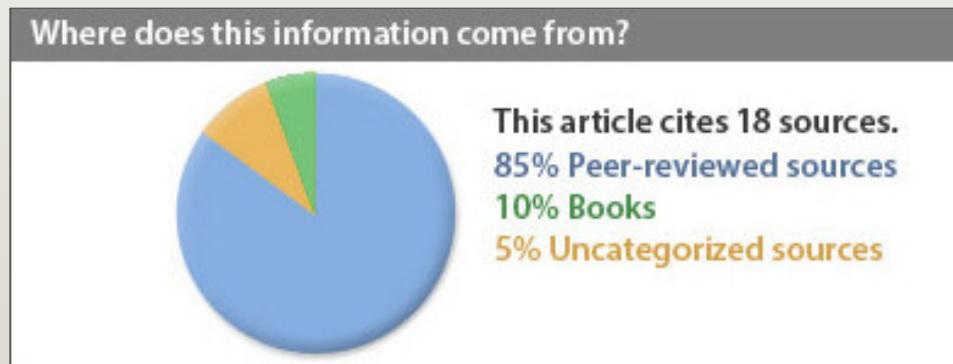
# VISUALIZING PROVENANCE



## Citations

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# VISUALIZING PROVENANCE



# VISUALIZING STEWARDSHIP

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The Free Encyclopedia

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## Moon

From Wikipedia, the free encyclopedia

*This article is about Earth's Moon. For moons in general, see [Natural satellite](#). For other uses, see [Moon \(disambiguation\)](#).*

The **Moon** is the only [natural satellite](#) of the [Earth](#),<sup>[nb 4][7]</sup> and the [fifth largest](#) satellite in the [Solar System](#). It is the largest natural satellite of a planet in the Solar System relative to the size of its [primary](#), having a quarter the diameter of Earth and  $\frac{1}{81}$  its [mass](#).<sup>[nb 5]</sup> The Moon is the second densest satellite after [Io](#), a satellite of Jupiter. It is in [synchronous rotation](#) with Earth, always showing the same face; the near side is marked with dark volcanic [maria](#) among the bright ancient crustal highlands and prominent [impact craters](#). It is the brightest object in the sky after the [Sun](#), although its surface is actually very dark, with a similar reflectance to coal. Its prominence in the sky and its regular cycle of [phases](#) have, since ancient times, made the Moon an important cultural influence on [language](#), [calendars](#), [art](#) and [mythology](#). The Moon's gravitational influence produces the [ocean tides](#) and the [minute lengthening](#) of the day. The Moon's current orbital distance, about thirty times the diameter of the Earth,

**The Moon** 

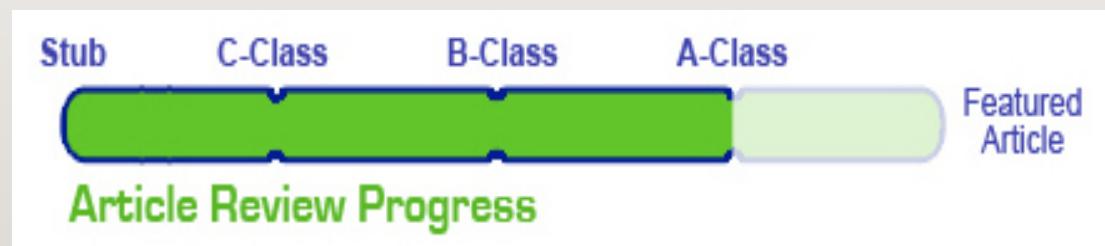
Full Moon as seen from Earth's northern hemisphere

**Designations**

|           |   |
|-----------|---|
| Adjective | <a href="#">lunar</a> , <a href="#">selenic</a> |
|-----------|---|

A red arrow points from the top right towards the "Log in / create account" button.

# VISUALIZING STEWARDSHIP



# MTURK STUDY

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- **Each participant assessed a plain article, then two of the four visualizations (REF, REFA, REVIEW, REVIEWA)**

Articles did not change, only the viz.  
No one person saw the same article twice.  
Paired high- and low-quality viz.  
Varied the order of visualizations presentation.  
Used best practices defined by (Kittur, Chi & Suh 2008; Towne et. al 2013.)
  - **244 participants, 682 article assessments**
-

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## Domestication

From Wikipedia, the free encyclopedia

*This article is about the process of artificial selection in animals or plants. For other uses, see [Domestication \(disambiguation\)](#).*

**Domestication** (from Latin *domesticus*) is the process whereby a population of living organisms is changed at the genetic level, through generations of **selective breeding**, to accentuate traits that ultimately benefit **humans**. A usual by-product of domestication is the creation of a dependency in the domesticated organisms, so that they lose their ability to live in the wild.<sup>[1]</sup> In the [Convention on Biological Diversity](#), a domesticated species is defined as a "species in which the evolutionary process has been influenced by humans to meet their needs."<sup>[2]</sup> Therefore, a defining characteristic of domestication is **artificial selection** by humans. Humans have brought these populations under their control and care for a wide range of reasons: to produce **food** or valuable **commodities** (such as **cotton**, or **silk**), for types of **work** (such as **transportation** and **warfare**), **scientific research**, or simply to enjoy as **companions** or **ornaments**.

Plants domesticated primarily for **aesthetic** enjoyment in the home are usually called **house plants** or **ornamentals**. Plants domesticated for large-scale food production are generally called **crops**. A distinction can be made between those domesticated plants that have been deliberately altered or selected for specific characteristics (see **cultigen**) and those plants that are



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Where does this information come from?

This article cites 19 sources.

|                           |
|---------------------------|
| 53% Peer-reviewed sources |
| 22% Uncategorized sources |
| 15% Books                 |
| 10% News articles         |

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# MEASURES

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- Quality: composite of well-written, accurate, unbiased, trustworthy, a bad source of information
  - Visualization Interpretation (open answer)
  - Visualization Effect
  - Global Visualization Effect
-

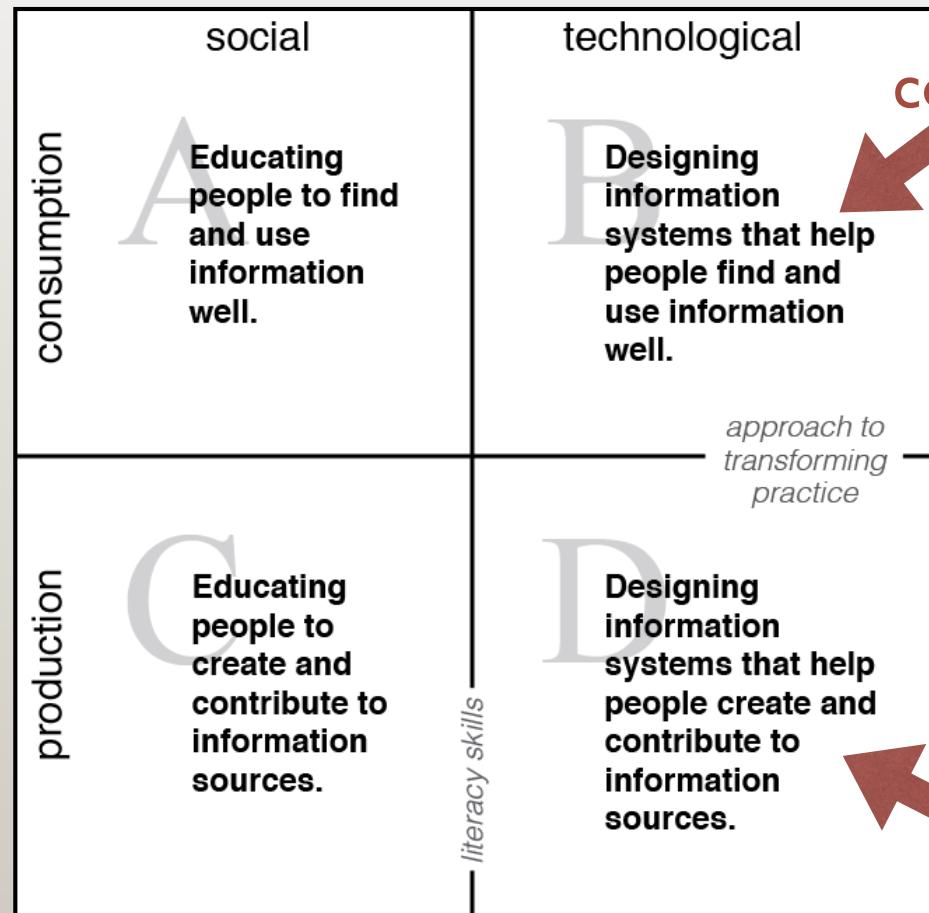
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# SOME FINDINGS

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- Confirmed both visualizations had predicted effects.  
i.e. People rated articles with “high-quality” viz higher than with “low-quality” viz.
  - Stewardship viz had more of an effect than provenance, especially among non-Wikipedia editors.
  - Provenance viz had a markedly strong effect among people with graduate degrees.
  - People on high and low ends of education spectrum are hardest to affect.
-

# INTERDISCIPLINARY LITERACY FRAMEWORK



**assessable interfaces**  
communicate features of information  
stewardship and provenance

systems that  
help contributors  
source their  
Information

Forte, Andrea et al. (2014). Designing Information Savvy Societies: An Introduction to Assessability. CHI.



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# WHY CITE SOURCES?

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1. a tool to strengthen and defend knowledge claims
2. a currency, the accrual of which lends credibility to scientists and their work

(Latour and Woolgar, 1988)

Make sure you give credit to the right people:  
36% of citations in one study were redundant!

(Moravcsik and Murugesan, 1979)

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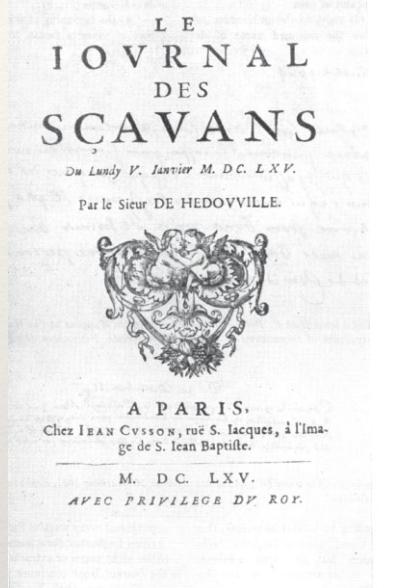
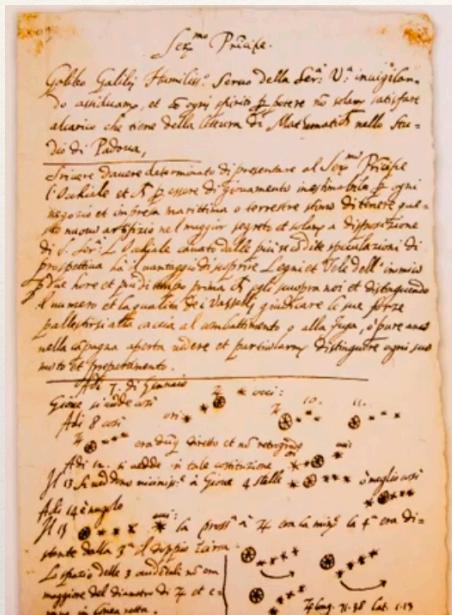
# WHEN NOT TO CITE?

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When a statement is accepted as fact, no-one challenges it.

- Merton: obliteration by incorporation
- Latour and Woolgar: stylization

# Social History of Citation

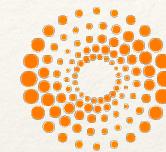
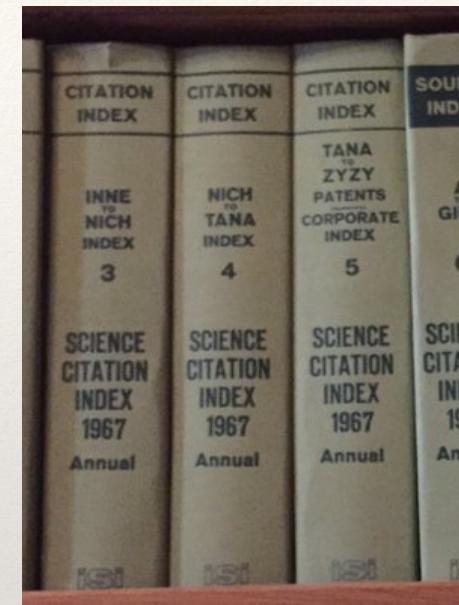


Letters/  
Personal  
relationships

Journals  
Citation Counts

Citation  
Indexes

(See paper.)



WEB OF SCIENCE<sup>SM</sup>  
THOMSON REUTERS

Microsoft Academic

Google Scholar

ResearchGate

Citations  
As Data

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# WHAT ABOUT ONLINE?

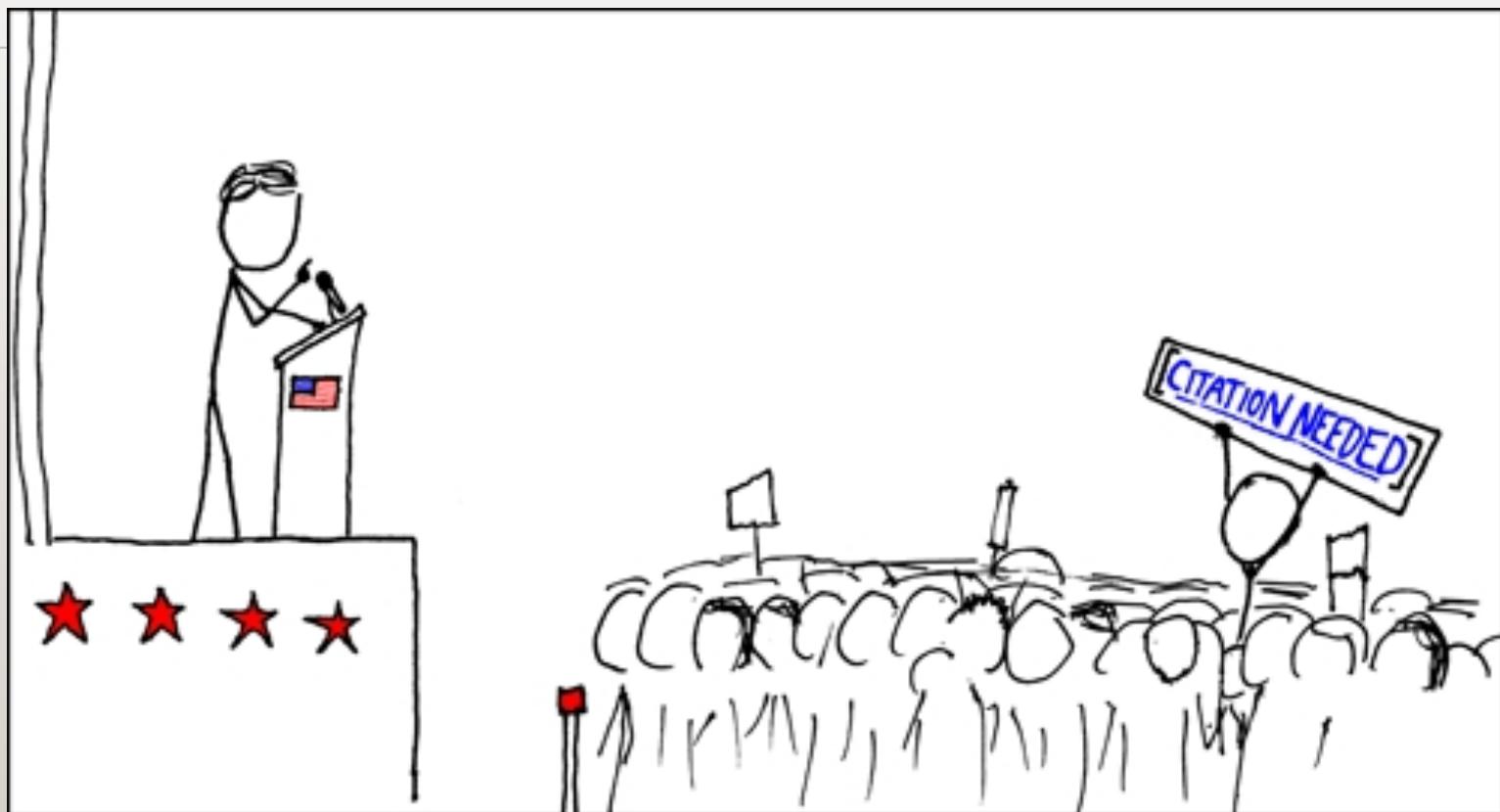
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[citation needed]

# WHAT ABOUT CITATION PRACTICES ONLINE?







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# STUDY OF CITATION IN WIKIPEDIA

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Mixed methods

- Article edit histories
- Interviews
- Document analysis

Integrated analysis, each piece informs the development of concepts

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# INFORMATION FORTIFICATION

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Defending encyclopedia content in face of controversy.

1. Naturally Arising
2. Manufactured

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# NATURALLY OCCURRING CONTROVERSY

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Real or perceived controversy that arises spontaneously as article co-editors work and interact and the world changes.

*“everything that is disputable is most likely to be challenged and has to have a reference with a reliable source”*

*“The rules strictly say that you only need to cite something if it's contentious, if someone is likely to bother you about it or disagree with it. But the reality is that you have to cite everything, because someone will decide that it's contentious.”*

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# MANUFACTURED CONTROVERSY

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Procedures that ritualize the process of challenging content. i.e. Peer review.

Centralized: encyclopedia-wide processes for article improvement, “good,” “featured” status.

Decentralized: [citation needed] tags added.

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# HOW IS THIS DIFFERENT?

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Unlike in science...

It's all about the information and relationships among pieces of information, it's not about authors and relationships among authors. The social piece is missing.

This isn't a community of similarly-trained experts, what seems like mundane information to one editor might be controversial to another.

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# EFFECTIVENESS?

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Do “manufactured” controversies engender citations of similar quality, type, quantity, etc, as natural ones?

What of [citation needed] tags?

*“someone... put a lot of ‘citation needed’ text on this article or removed stuff which was not referenced. And then I thought, ‘okay, it’s a shame that all this stuff has to be removed because it’s not referenced,’ and then I did some work and Googled for some references and added them”*

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[Leaderboard](#)

English

# Citation Hunt

The Wikipedia snippet below is not backed by a [reliable source](#). Can you find one?

Click **I got this!** to go to Wikipedia and fix the snippet, or **Next!** to see another one. Check [Introduction to referencing with VisualEditor](#) if you have questions. Good luck!

In page [Julio-Claudian dynasty](#):



Nero reportedly committed suicide with the help of his scribe Epaphroditos. The Senate, who were trying to preserve the dynastic bloodline by saving Nero's life were additionally reluctant to let someone who was not of the family to become emperor had no choice but to declare him a public enemy posthumously with Galba marching on the city so as Nero had committed suicide because of the decree. With his death, the Julio-Claudian dynasty came to an end. Chaos ensued in the Year of the Four Emperors. [citation needed]

[I got this!](#)[Next!](#)

# INTERDISCIPLINARY

# LITERACY FRAMEWORK

**assessable**

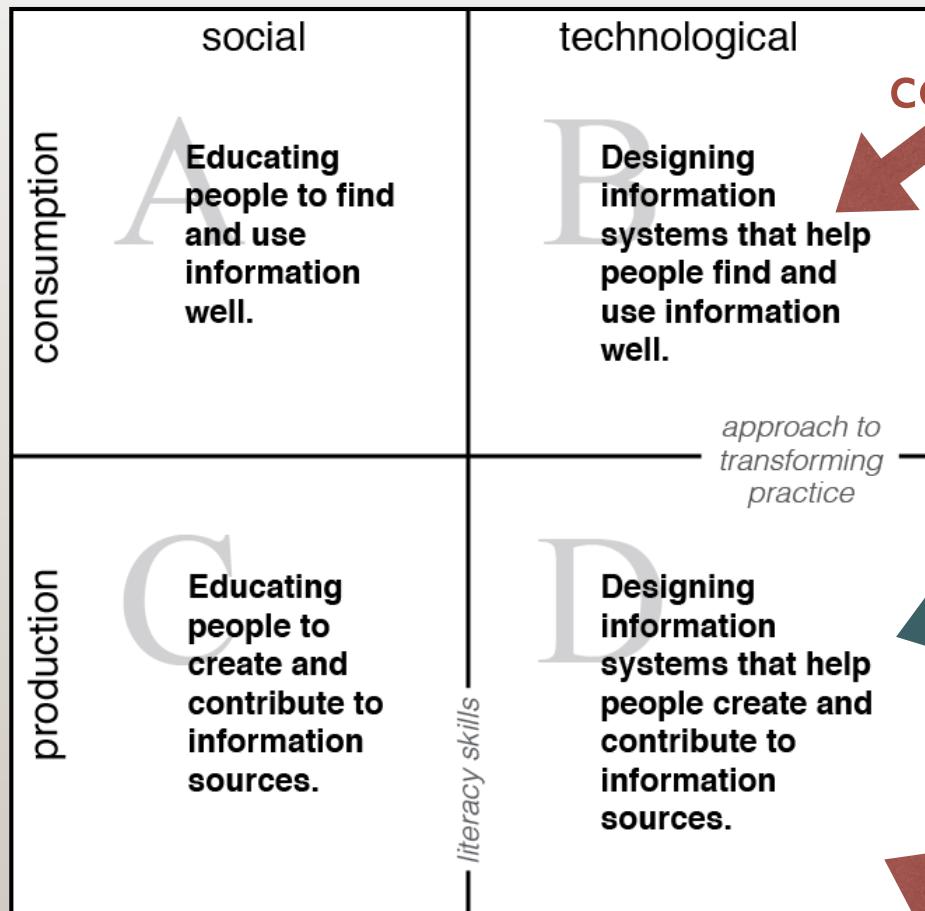
**interfaces**

communicate features  
of information  
stewardship  
and provenance

**systems that**  
**help contributors**  
**participate in**  
**information**  
**production safely**

systems that

help contributors  
source their



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# THANKS

questions now...

or later: [aforde@drexel.edu](mailto:aforde@drexel.edu)

