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Assessing Students' Critical Thinking about Digital Information via Statistical Analysis

Kim L. Ranger

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Welcome!

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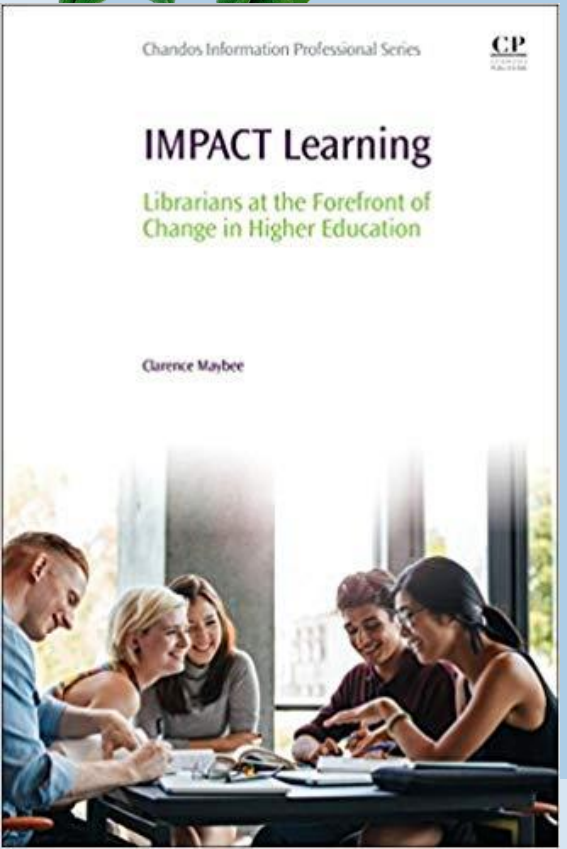


Maybee:

- informed learning design
- informed learning outcomes

Statistical analysis 1

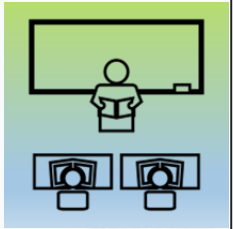
Odds Ratio and Relative Risks

Statistic	Value	95% Confidence Limits (range)	
Odds Ratio (likeliness) Website fit criteria: company & product reliable	**6**	3	14
Relative Risk (probability) incorrect answer: incorrect answer	**3**	2	4

Statistical analysis 2

Students do better critical thinking when fact checking.

Improve your course activities: Teach students to fact check.



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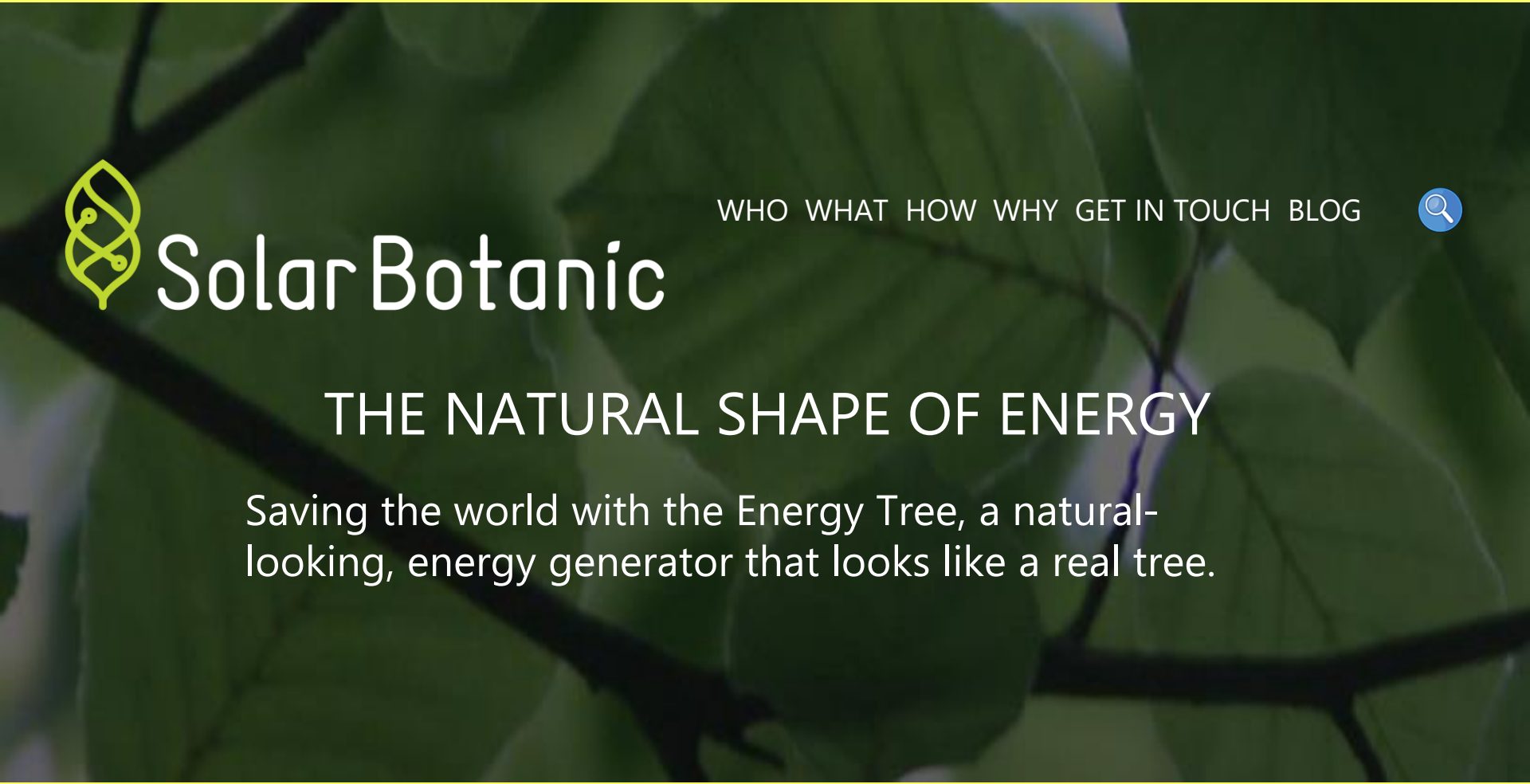
Fact check means verify **externally**—

- **Plan**
- **Search in tabs**
- **Skim**
- **Double-check**


SolarBotanic
WHO WHAT HOW WHY GET IN TOUCH BLOG
THE NATURAL SHAPE OF ENERGY
Saving the world with the Energy Tree, a natural-looking, energy generator that looks like a real tree.

Snopes, Politifact, FactCheck

Think of yourself as a professional fact checker from the [X] **field/discipline**.

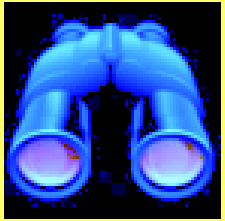
Before exploring an information source when you're inexperienced in that discipline, make a plan.

Fact check means verify **externally**—

- **What** to fact check**?**
- **Open tabs** for searching
- **Skim before clicking**
- **Double check**

SolarBotanic

60 seconds



libguides.gvsu.edu/cap115/eval

Truthworthy? → Reliable? → Reputable?

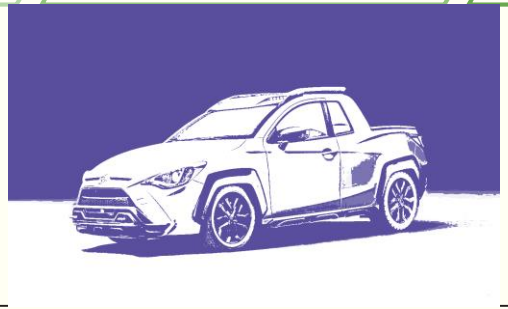
Yes

No

libguides.gvsu.edu/cap115/post-activity

Truthworthy? → Reliable? → Reputable?

Yes



No

Statistical analysis 3

62% correctly answered last question in post-test

McNemar's test for agreement	
Exact Pr >= S	**0.0018**

Students treated 2nd & 3rd questions as dependent (scaffolded)

Monte Carlo Estimate for the Exact Test	
Pr <= P	**0.0034**

“Source **criticism**: **start somewhere**….”

”

Adapt for your discipline: Think/pair/share

Plan, search in **lateral** tabs

Skim: practice **click restraint**

Double check (verify)

To evaluate is to question!

?	Lateral tabs	Click Restraint	Double check
Search			
Skim			
Verify			

Critical thinking about **digital information**:

- **Teach** students to **fact check**
- Use **statistical analysis** to **assess learning**
- **Improve teaching**

Questions?

Thanks!

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Credits 1

Breakstone, Joel, Sarah McGrew, Mark Smith, Teresa Ortega, and Sam Wineburg. (2018). Why we need a new approach to teaching digital literacy. Phi Delta Kappan, 99(6), 27.

Dobbin, Kourtney J. & Mitch A. Hoezee. (2019). Journal/Article Credibility Analysis for: Kim Ranger [Faculty Librarian at Grand Valley State University]. Analysis done for STA 419: Professor Gabrosek.

GVSU Statistical Consulting Center. Director Sango Otieno and collaborators (Statistics Majors/Graduate Students in Biostatics/Data Science Aubree Batchelor, Forrest Chase, and Abigail Zysk: 1st analysis)
(Graduate students Dan Weglarz and Kylie Springer: 3rd analysis)

Johannessen, H. (2017). "Teaching source criticism to students in Higher Education: A practical approach." In Siri Ingvaldsen & Dianne Oberg (Eds.), Media and information literacy in Higher Education: Educating the educators (89-105). Cambridge: Chandos Publishing.

Credits 2

Maybee, C. (2018). IMPACT learning: Librarians at the forefront of change in Higher Education. Cambridge: Chandos Publishing.

Wineburg, Sam, and Sarah McGrew. (2017). Lateral Reading: Reading Less and Learning More When Evaluating Digital Information. Stanford History Education Group Working Paper No. 2017-A1. http://dx.doi.org/10.2139/ssrn.3048994

Special thanks to those who made and released these resources for free:

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