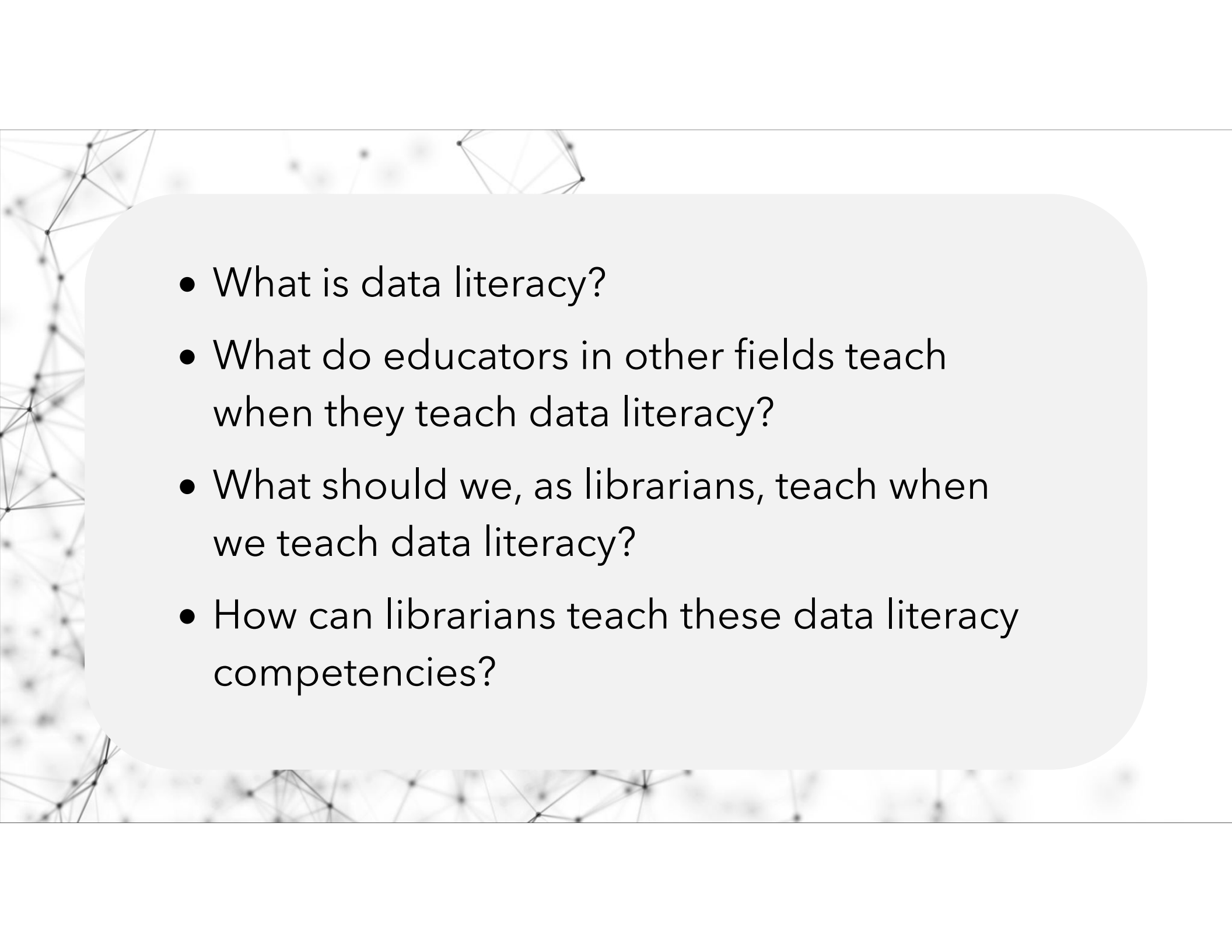# What Do We Teach When We Teach Data Literacy?

Julia Bauder, M...

Social Studies and Data Se...

Director of the Data Analysis and Social Inquiry...

Grinnell College, Gr...

- What is data literacy?

- What do educators in other fields teach when they teach data literacy?

- What should we, as librarians, teach when we teach data literacy?

- How can librarians teach these data literacy competencies?

What *Is* Data Literacy?

Statistics Canada's Data Literacy Competencies

Data analysis

Data awareness

Data cleaning

Data discovery

Data ethics

Data exploration

Data gathering

Data interpretation

Data management and organization

Data modeling

Data stewardship

Data tools

Data visualization

Evaluating data quality

Evaluating decisions based on data

Evidence based decision-making

Metadata creation and use

Storytelling

https://www.statcan.gc.ca/en/wtc/data-literacy/compentencies

Competencies Found by Bonikowska, Sanmartin and Frenette

Plan, implement and monitor courses of action

Undertake data inquiry process

Knowledge and understanding of data, its uses and applications

Critical thinking

Data culture

Data ethics

Data tools

Data discovery

Data collection

Data management and organization

Data manipulation

Evaluating and ensuring quality of data and sources

Data citation

Basic data analysis

Data visualization

Presenting data verbally

Data interpretation

Identifying problems using data

Data driven decision making (DDDM)

Metadata creation and use

Evaluating decisions/conclusions based on data

Data duration and re-use

Data sharing

Data preservation

Data conversion

Develop hypotheses

Work with large data sets

Bonikowska, A., Sanmartin, C., & Frenette, M. (2019, August 14). *Data Literacy: What Is It and How to Measure It in the Public Service*. https://www150.statcan.gc.ca/n1/en/pub/11-633-x/11-633-x2019003-eng.pdf

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Competencies Found by Downes

Awareness	Requirements	Cleaning	Modeling/Architecture
Dispositions	Valuation	Systems & Tools	Data Science & ML
Strategy/Culture	Evaluation/Assessment	Policy	Citation & Sharing
Plan, Implement, Monitor	Informed Decision-making	Quality	Visualization
Inquiry Process	Governance/Stewardship	Security	Storytelling
Discovery/Explore	Standards	Manipulation	Present Data Verbally
Ethics	Description/Metadata	Statistics & Reasoning	Change
Gathering/Collection	Conversion, Interoperability	Critical Thinking	Using/Innovating
Curation	Management	Analysis	Identifying Problems
Communities	Preservation	Interpretation	Generate Data

Downes, S. (2023). Three frameworks for data literacy. In D. G. Sampson, D. Ifenthaler, D., & P. Isaías (Eds.), *Proceedings of the 20th International Conference on Cognition and Exploratory Learning in the Digital Age* (107-115). IADIS Press. https://files.eric.ed.gov/fulltext/ED636095.pdf

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Downes' Competency Models
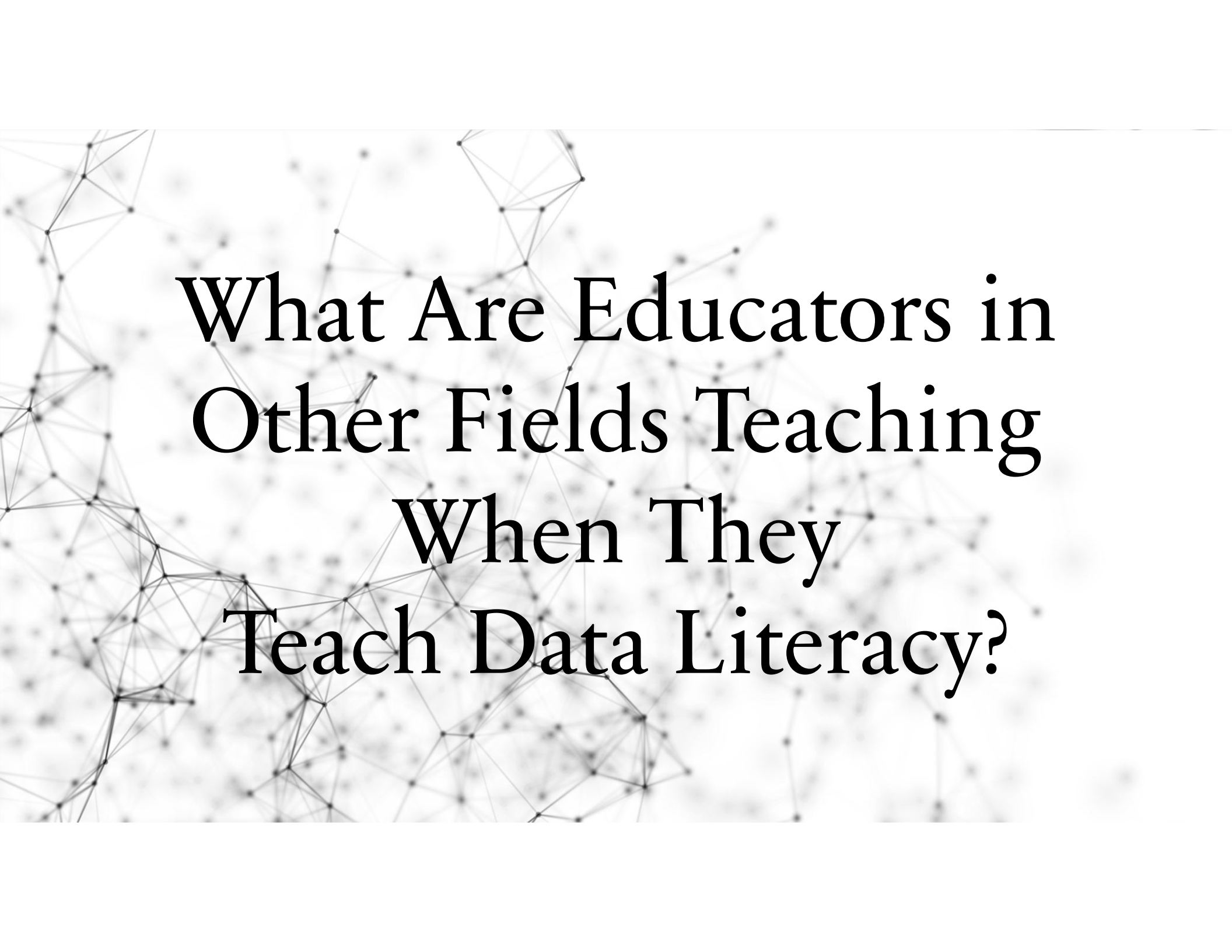
Data Stewardship Model

Analysis and Decision-Making Model

Information Literacy Model

Science and Research Data Literacy Model

Social Engagement Model

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What Are Educators in Other Fields Teaching When They Teach Data Literacy?

ASA's Skills for Statistics Majors

- Statistical methods and theory

- Data management and computation

- Mathematical foundations

- Statistical practice

- Discipline-specific knowledge

American Statistical Association Undergraduate Guidelines Workgroup. (2014). *Curriculum Guidelines for Undergraduate Programs in Statistical Science.* Alexandria, VA: American Statistical Association. https://www.amstat.org/asa/files/pdfs/EDU-guidelines2014-11-15.pdf

APSA's Skills for Political Science Majors

1. Analyze political phenomena and critique arguments in a theoretically and empirically informed manner.

2. Engage as citizens through problem solving, collective action, and collaborative decision making at all levels from local to global.

3. Identify, evaluate, properly use, and cite verifiable sources of evidence.

4. Engage thoughtfully and respectfully with competing values and perspectives.

5. Use qualitative and quantitative methods effectively and appropriately.

6. Communicate effectively in written and verbal modes to a variety of audiences.

APSA Presidential Task Force (2024, March). *Rethinking Political Science Education*. Washington, DC: American Political Science Association. https://educate.apsanet.org/wp-content/uploads/APSA-Presidential-Task-Force-Report-on-Rethinking-Political-Science-Education-March-2024.pdf

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What Should Librarians Teach When We Teach Data Literacy?

What Data Literacy Skills Do *Your* Students Need?

Do *Your* Students Need
Data Stewardship Competencies?

- Do they intend to pursue a career where they will be responsible for generating and/or managing research data?

- Do they intend to pursue a career where they will be responsible for generating and/or managing other types of data that need to be preserved and shared?

Carlson, J., & Johnston, L. R. (Eds.). (2015). *Data Information Literacy: Librarians, Data, and the Education of a New Generation of Researchers*. West Lafayette, IN: Purdue University Press.

What Data Literacy Skills Do *All* Students Need?

Critical Data Literacy

Teaching Data Literacy Competencies Critically

Data Discovery

Data Interpretation

Data Evaluation

Data Visualization

Julia Bauder

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