What's Guiding Chemical Engineering?: A LibGuide Content Analysis

June 23, 2026

Sarah Weiss, University of Maryland, College Park

Leah DiCiesare

Introduction

- Springshare LibGuides are the most commonly used tool in academic libraries for creating research guides
- Guides require updating as resources are updated, superseded or defunct
- Pedagogy Conversation
  - User Centered- focuses on the needs of the user
  - Learner Centered- focuses on the needs of the learner

Research Questions

- What content is most frequently occuring on chemical engineering LibGuides at R1 research universities?
- How common is a learner-centered vs. user-centered approach to presenting information on chemical engineering LibGuides at R1 research universities?

Background & Literature Review

- Content analysis
  - A systematic method for examining and categorizing communication artifacts such as documents or web pages in order to identify patterns, themes or trends [1]
  - Allows assessment of information presented and how it is structured and framed for users
  - Has been applied to LibGuides, in a growing body of research, especially over the past two decade
    - Studies examine various aspects of design including layout, content type, and pedagogical intent.

Background & Literature Review cont.

- Engineering LibGuide Content Analysis
  - N. L. Osorio (2014) “Content Analysis of Engineering LibGuides” [2]
    - Mechanical and electrical engineering guides
    - focusing heavily on content, particularly databases
  - A. Wood (2024) “Librarian Recommended: A Survey of Engineering Education Resources in Library Research Guides” [3]
    - Engineering education resource guides

Methodology

Data set

- *US News and World Report 2023-2024 Best Engineering Schools* list (~200 institutions)
  - Sample set: 50 schools, 20 top schools and 30 random from remainder of list
  - Considered R1 schools only
- Chemical engineering as well as multidisciplinary guides which explicitly included chemical engineering such as “chemical and biomolecular engineering.”
  - general engineering guides excluded
- Final data set: 29 guides

Methodology cont.

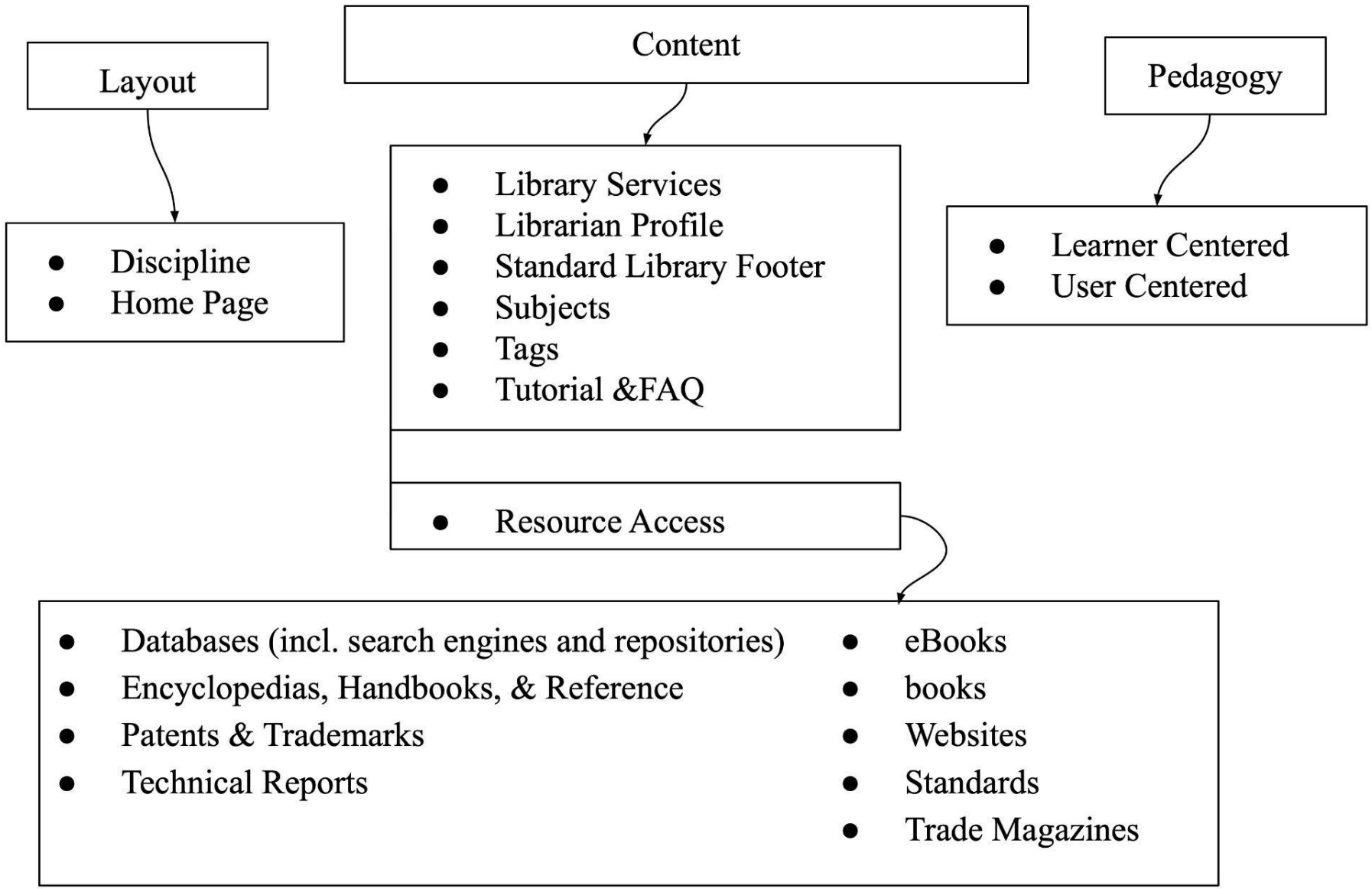
Data Collection

- Guides saved as PDF files and imported into Nvivo
- Documentation to keep track of coding changes

Notes on changes

- Initially planned to analyze every engineering discipline guide and narrowed to chemical engineering
- Coding was initially more broad, then narrowed to focus on resource access and pedagogy

Coded Variables



Open Resources

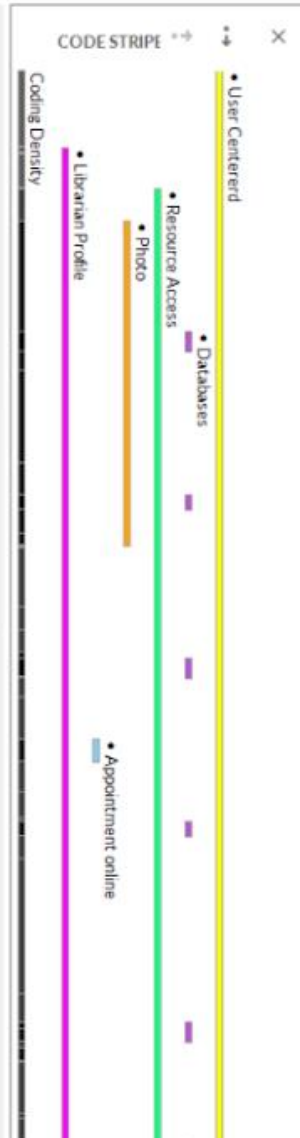
- Setting up Google Scholar with UMD access links: **FAQ** & **full instructions**

Good luck on your research, teaching, and learning!

Chemical & Biomolecular Engineering Resources

Below are a few recommended databases. You can access all the databases UMD subscribes to via **Database Finder**.

- **ACS symposium series**
  The ACS Symposium Series contains high-quality, peer-reviewed books developed from the ACS technical divisions' symposia. Information about this series is available at http://pubs.acs.org/series/symposium, where users can also perform searches of the volumes by citation, author, topic, or volume." Access to volumes from 1974-2011.
- **Knovel**
  Knovel's collection includes over 2,000 leading reference works and databases from over 70 leading technical publishers and professional societies including AIAA, AIChE, ASME and NACE. Content collection includes material properties, process and design information, best practices, equations and formulations for specific industries and engineering disciplines.
- **Materials Science & Engineering Database**
  Materials Science & Engineering Database covers topics such as metals, polymers, ceramics, composites, and biomaterials and deals with areas such as corrosion, molding and casting, treatment, recycling, testing, finishing, welding, and forming. In addition to scholarly publications, this resource includes patents, conference proceedings, government reports, and more.
- **PubMed**
  The National Library of Medicine's Medline database that provides abstracts and indexing for about 4,600 biomedical journals published in the U.S. and 70 foreign countries, and includes additional older citations and out of scope citations from Medline journals. Medicine, nursing, dentistry, veterinary medicine, psychiatry, pre-clinical sciences, medical education, public health, health care planning and administration of services. Also includes additional life science journals. mid-1960s - present
- **Reaxys**
  Includes chemical structures, reactions, and physical properties, plus pharmacological and toxicological data, specific bioassay results, logPs, and more. Searchable by chemical name or structure. (Note: Reaxys is a single platform that combines the former Beilstein, Gmelin, and Patent Chemistry Database.)

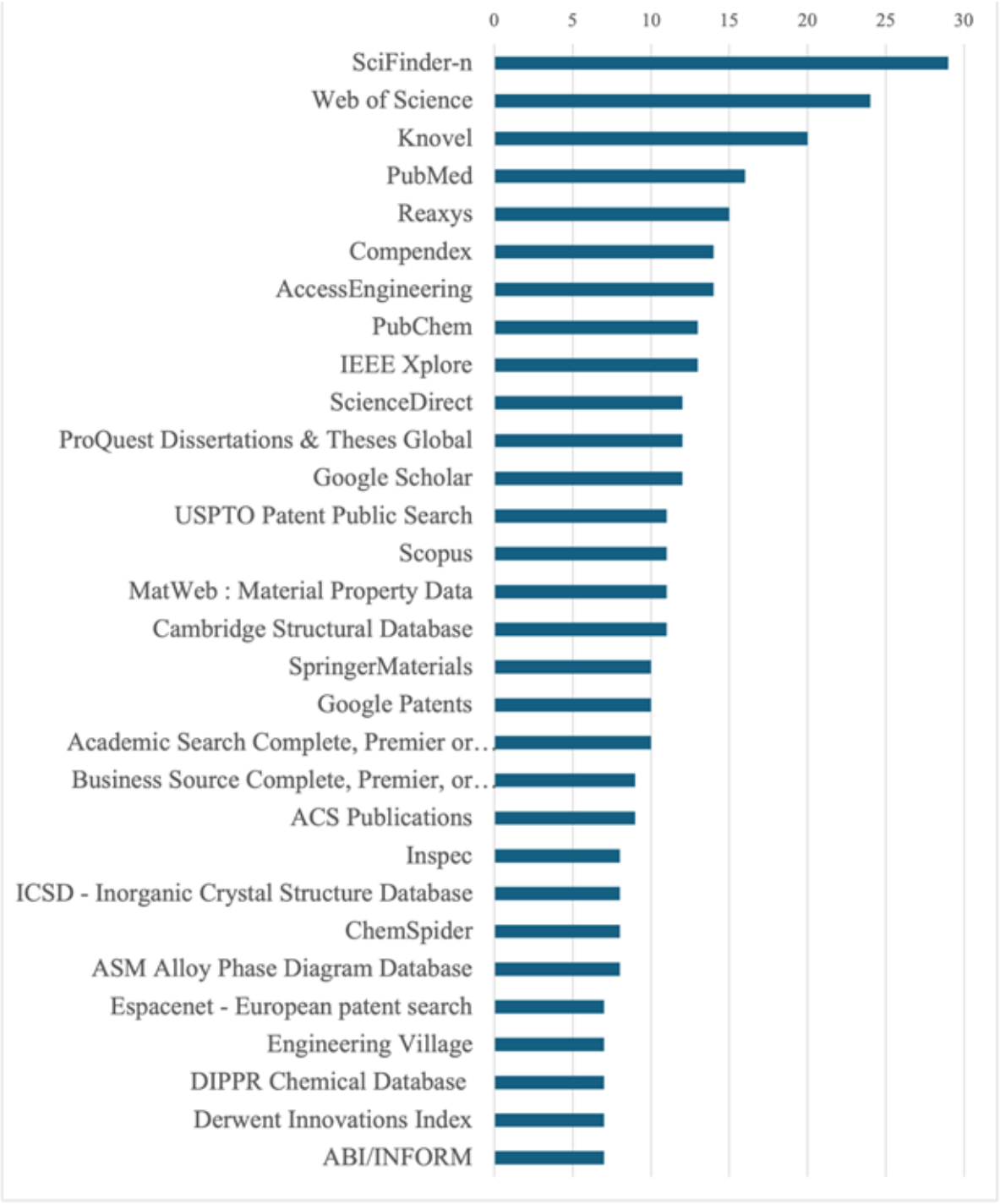


Frequency of resource types across guides

Resource Type	Number of guides
Databases	29
Reference Works	28
Websites	27
Library Catalog	24
Patents & Trademarks	16
Books & eBooks	15
Journals	12
Standards	11
Other	11
Multimedia	9
Trade Magazines	9
Dissertations & Theses	7
Technical Reports	5

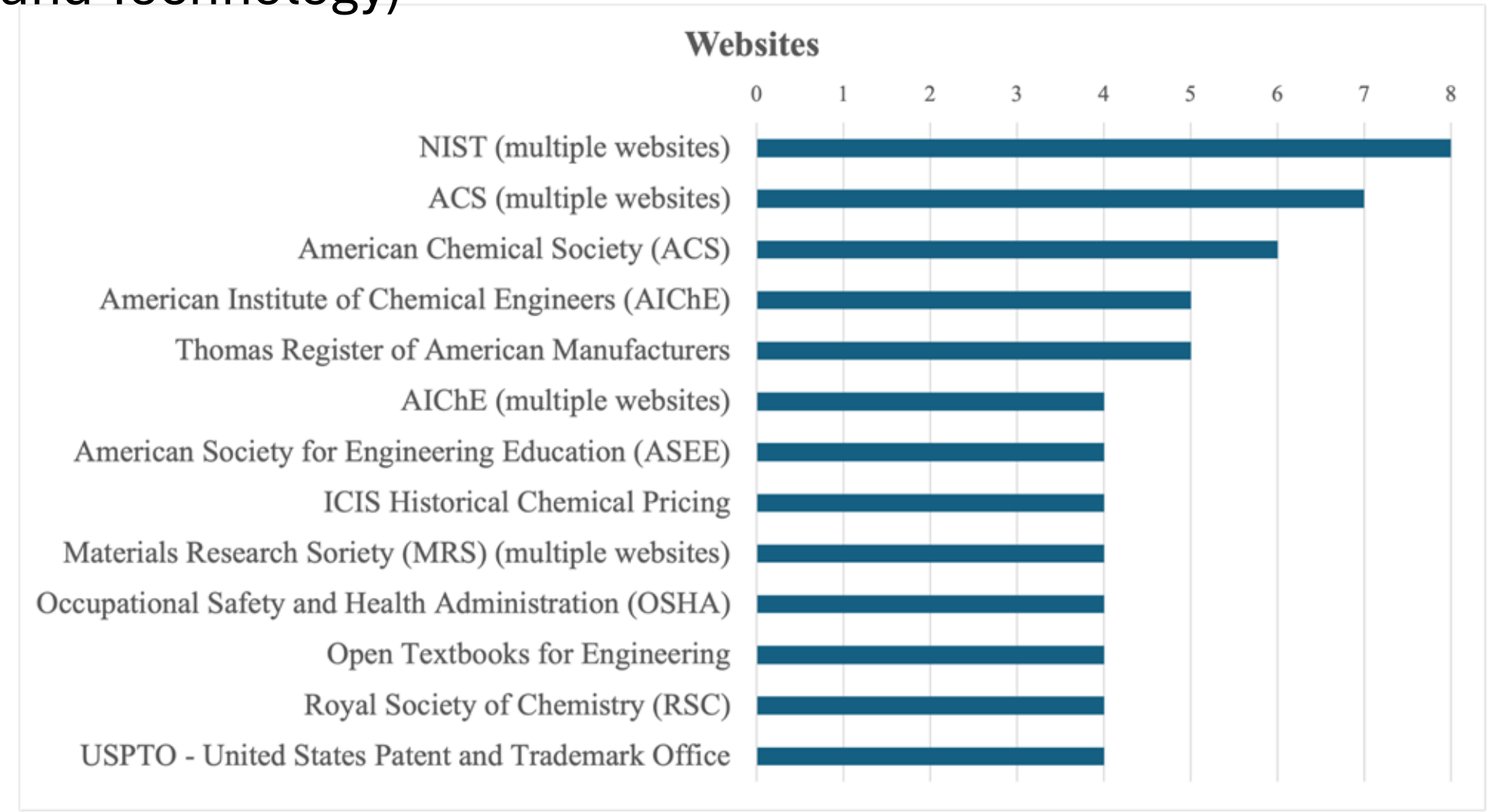
Database frequency across guides

- SciFinder-n: 100% (29)
- Knovel: 83% (24)
- Web of Science: 69% (20)
- PubMed, Reaxys, Compendex, AccessEngineering: ~50% (14-16)

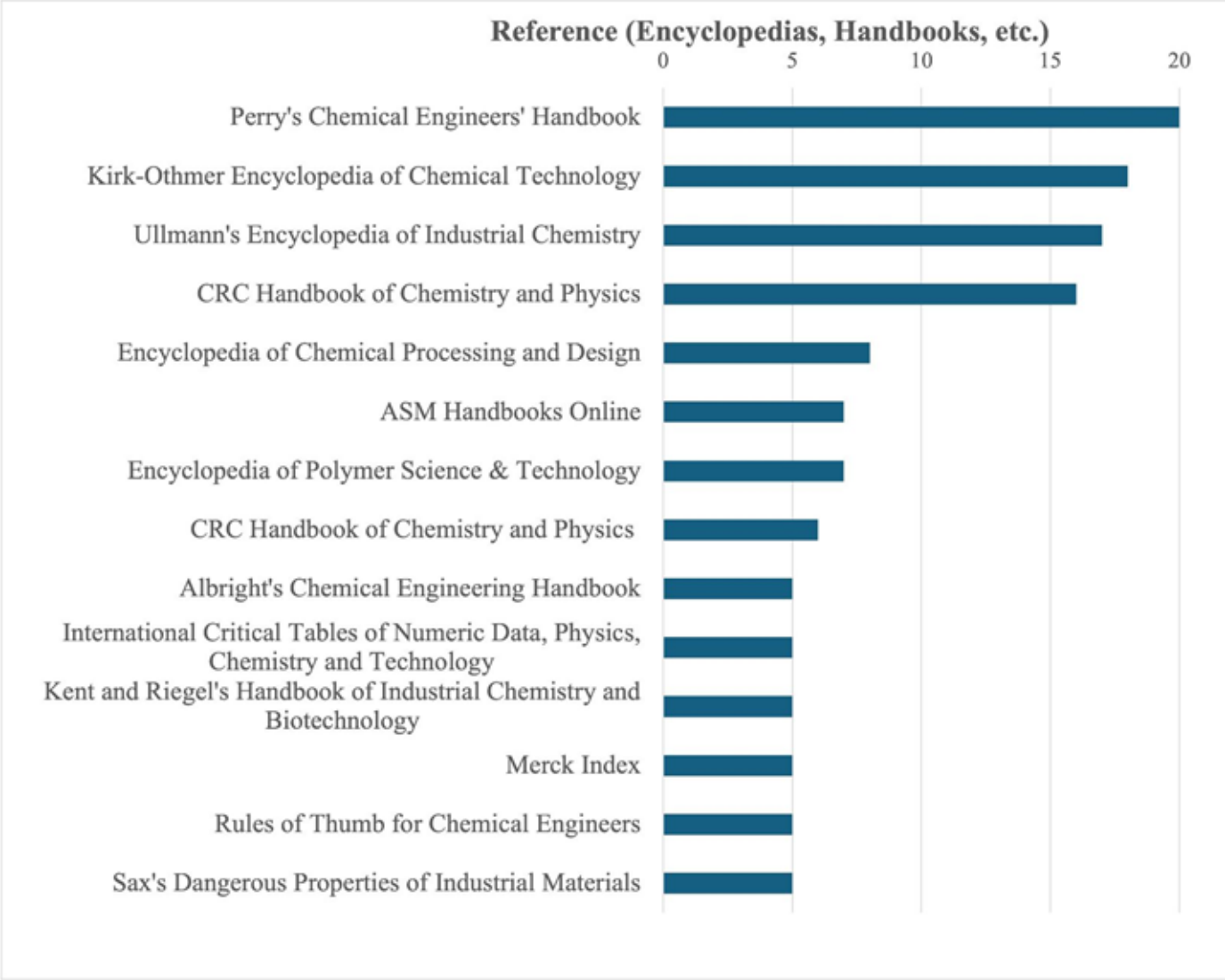


Websites

- NIST (National Institute of Standards and Technology) 28% (8)



Reference Works



- *Perry's Chemical Engineers' Handbook*
- *Kirk-Othmer Encyclopedia of Chemical Technology*
- *Ullmann's Encyclopedia of Industrial Chemistry*
- *CRC Handbook of Chemistry and Physics*
- 55%-69% (16-20)

Pedagogy

- User centered: 85%
- Learner centered: 15%

Implications & Questions

- There is a level of consistency in resources presented, especially databases & reference works
- Method has its limitations: resource names & standardization
- Subscriptions based resources are predominant
- Guide content is heavily skewed towards user-centered content

Recommendations

- Conduct future analyses with a well-defined scope
- Realistic goals
- Larger research team
- Many unexplored resource guides to tackle

References

[1] K. Krippendorff, *Content Analysis: An Introductino to Its Methodology*, 4th ed. Thousand Oaks, California: Sage, 2019.

[2] N. L. Osorio, “Content Analysis of Engineering LibGuides,” presented at the 2014 ASEE Annual Conference & Exposition, Jun. 2014, p. 24.318.1-24.318.23. Accessed: Dec. 05, 2023. [Online]. Available: https://peer.asee.org/content-analysis-of-engineering-libguides

[3] A. Wood, “Librarian Recommended: A Survey of Engineering Education Resources in Library Research Guides,” *Issues Sci. Technol. Librariansh.*, no. 110, May 2025, doi: 10.29173/istl2881.

For a full list of references, please see the conference paper that accompanies this presentation.