

Using a synthesis matrix to plan a literature review

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Course & Goals

- **Course**

- Capstone in Data Science (CDS 492)

- **Overview**

- Provide a capstone experience for undergraduate students by synthesizing knowledge and experience that they acquired in earlier coursework to address a complex Data Science problem.
- This course requires analytical, collaborative, and communication skills.

- **Goals**

- Allow students to implement and demonstrate their core skill set in their major.
- Develop integrative multi-disciplinary problem-solving skills.
- Promote critical thinking, including the ability to critically examine existing works and established methods, and develop innovative approaches.
- **Enhance and develop rigorous writing and presentation skills.**
- Enhance students' ability to work and manage a project collaboratively.

Challenges – Literature Review

- Summarizing the work & identifying gaps.
- Grouping liked ideas.

Researcher A suggests that X is true. Researcher B also argues that X is true, but points out that the effects of X may be different from those suggested by Researcher A.

vs

Researchers A and B agree that X is true, but they disagree on X's effects.

- Presenting work as a story rather than a collection of disjoint statements.
- Conceptualizing into a cohesive whole.
- Paraphrasing.

Opportunities – Synthesis Matrix

- A visual tool used to help organize your sources of information, presenting it as a chart that allows a researcher to sort and categorize the different arguments presented on an issue.

| Sources | Research question/ hypothesis | Methods | Findings | Strengths | Limitations |
|--|---|---|--|--|---|
| <i>Where is the current work located?</i> Reference to source. Must use a consistent citation format. | <i>What issue is the paper addressing?</i> The research question that the paper sets out to answer, or a hypothesis that the authors set out to support or disprove. | <i>How was it performed?</i> What approaches, methods, tools and techniques were used? | <i>What did you find?</i> Describes the data that was collected and the results of any statistical tests/ analysis that were performed. | <i>What was particularly good about the paper?</i> This section typically highlights the major contribution about the current work. | <i>What were the shortcomings of the current work?</i> What could be done to improve the current work. |

Results

- Easy to use.
- Makes writing *less intense*.
- Emphasizes *Discovery and Understanding* rather than *adding previous work*
- Easy to reorder papers into groups.
- Keeps you focused on your goals.

Thank You

Questions?

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