

INTRODUCTION & BACKGROUND

- ❖ Current studies focusing on AI use in the classroom are dynamic and ever-changing. For every new study that offers insights, another quickly emerges recommending a new framework. Studies have explored the **frequency of student AI use** (Hirabayashi, Jain, Jurković, & Wu, 2024), **faculty trepidation** (Bower et. al., 2024), **opportunities and challenges for English Second Language learners** (Kim, Yu, Detrick, & Li, 2025, Putra, 2023), and **student expectations** for high outcome help (Riggin, 2023). However, despite commentaries about AI's potential, few studies have explored how **AI can be leveraged in the classroom as a learning and teaching tool**, especially its impact on student self-assurance in the research process.
- ❖ Newer AI studies have recently focused on how **teachers incorporate generative AI into course material** and the specific advantages/disadvantages to this incorporation (Colby, 2025). Our study also incorporates generative AI into course material to discuss **how AI supports and challenges critical faculties within the research-learning process**. Presenters will share the results of qualitative and quantitative research coding students' perceptions and experiences of using AI to evaluate, summarize, and outline academic sources in an upper division biological science course as well as a lower division writing and research course. The poster will focus on (1) how a confluence of data can impact **current AI research in composition studies, biological sciences and SoTL**; (2) how the results can advance understanding of **student perceptions, expectations, and barriers** to using AI for research and writing tasks; and (3) how these **perceptions can influence methods for teaching research**.

Key Research Question

How can AI be leveraged in the classroom as a learning and teaching tool, especially to support student self-assurance and knowledge development in the research process.

INTERACTIVE

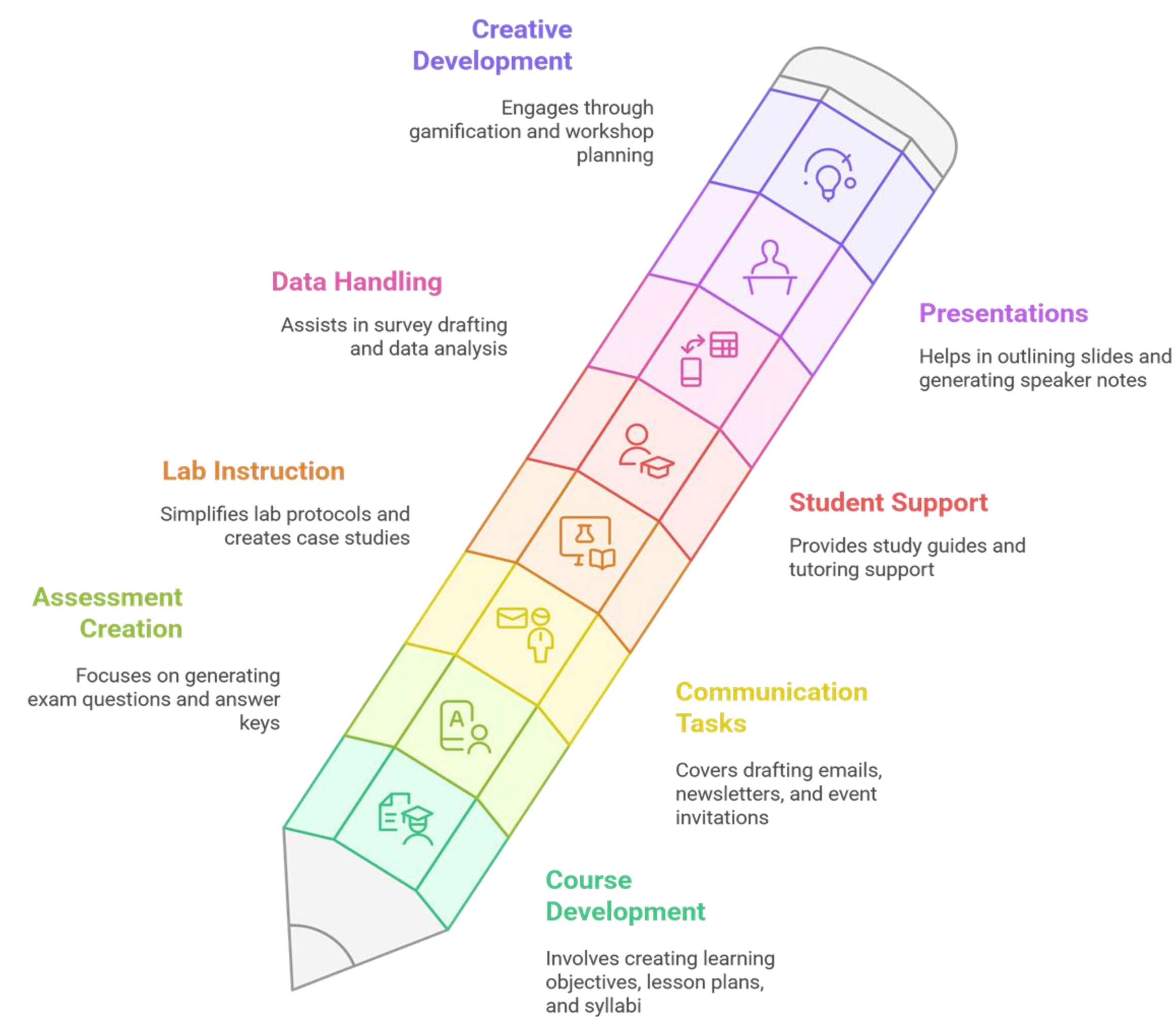


Illustration by Napkin.ai

John Zubek, PT, MS, DPT, Michigan State University, ADInstruments Brain Trust 2025

How might you want to use AI in a classroom experience?

What do you want to learn more about to use AI effectively?

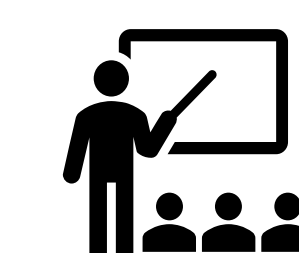
MATERIALS & METHODS

Procedures & design: IRB approved study, Spring WRIT course and BIOL course

Students completed a Pre-survey in Canvas the first week of Spring 2025 quarter to assess previous experience using AI resources for educational goals (approximately 10 minutes). Students completed assignments in each of the two courses (WRIT 1133 and BIOL 3242) as prescribed as part of each course experience. Part of these experiences asked students to utilize AI to complete specific elements of the assignment and compare the AI outcomes to student specific work. This activity applied to the reading and summarizing of existing research studies within each discipline, with students reading and summarizing on their own and comparing their research article summary to one generated by AI.



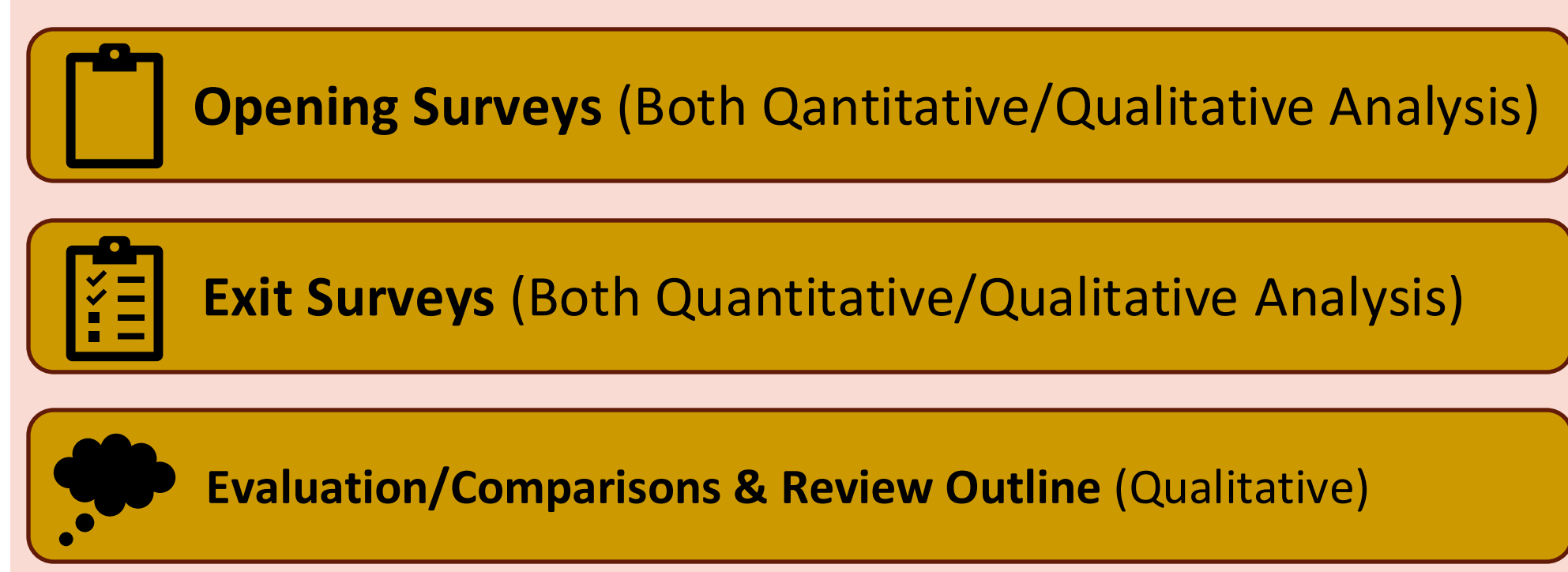
WRIT 1133: 17 students



BIOL 3242: 92 students

In addition, students created a final product they authored as the outcome of the assignments (WRIT = ; BIOL = Critical Analysis Report (C.A.R.)). The final projects were scaffolded throughout the entire duration of the Spring quarter 2025, with the AI assignments being implemented mid-quarter.

Students also completed a Post-survey in Canvas the final week of Spring 2025 quarter to evaluate the impact of AI on student self-assurance in the research process and envision how AI supports and challenges critical faculties within the research-learning process. Research will be conducted during the Spring 2025 quarter by Chapman-Ludwig and Hurtt in their respective courses; data will be analyzed during the summer and fall 2025 quarters.



- ❖ This **mixed method study** assessed student perceptions of AI use in research writing in a Biology course and Writing & Research course at DU during Spring 2025.

- ❖ Each course included AI integrated assignments asking students to practice writing summaries or literature review outlines with academic sources (journals in the field).

WRIT 1133 AI integrated assignment

BIOL 3242 AI integrated assignment

Literature Review Source Template

Directions: Before starting to organize an outline for your paper please look at the sources you have gathered. Once you have identified the themes/topics/patterns you are seeing with the sources you can begin to draft an outline for the review.

***Without using AI help complete steps 1 and 2 on your own.**

1) Take a look at your sources again, this time:

- Identify a few topics/themes that come up in multiple sources
- Write 3-4 separate sentences that identify 3-4 potential topics/themes/patterns
- Identify which sources, although worthy, do not belong or are outliers

2) For each major paragraph begin drafting one theme or pattern, remembering the following:

- Introduce or define your theme
- Explain what several researchers have said and/or how thinking about this theme has changed in the scholarship
- Where possible, identify or explain potential gaps or limitations of research

***Using the themes you created above, complete step three by incorporating AI to generate the actual outline. Be sure to identify the AI platform that was used, the date/time stamp of the software included, and the prompt you gave the AI to create the outline. Include a screenshot of the prompt with your actual outline submission.**

3) Compile the outline of the literature review.

Include your outline below with:

- an opening paragraph that provides an overview of what sources are discussing currently around your discourse community
- 4 or 5 body paragraphs or at least a topic sentence with a source or two in each paragraph, and
- a final paragraph that discusses the potential gaps in current scholarship and explains how your research will fill these gaps (remember to avoid 1st person).

NAME: _____ Date: _____

LITERATURE SUMMARIES TEMPLATE

- The content below each section (Intro/Methods/Results/Discussion) should be written in complete sentences with the best grammar, spelling, and sentence structure possible. Complete your work in paragraph form to follow best practices for writing scientific papers/reports.
- Each article summary should be NO MORE THAN 1 page SINGLE SPACED, excluding the figure analysis (that can extend to page 2).
- Each must be minimum 11 pt in Calibri, Helvetica or Times; Margins 0.75" on all sides; single spaced.
- Delete this entire set of instructions, and the questions under each section, when submitting your final article summary.

Citation of Original Article (use the citation format defined by the journal)

SUMMARY

Introduction:

- 3 most important/interesting concepts (background information) of this study:
 - First
 - Second
 - Third
- HYPOTHESIS/QUESTION OF INTEREST/PURPOSE** (Copy this verbatim (directly) from the article):

Methods:

- Who/what were the subjects of the study?
- How many subjects were in each group (control and experimental)?
- What are the specific differences being evaluated between the control and experimental groups?
- What specific methods were used to test for differences between control & experimental groups. (i.e. what did the researchers do specifically with/to the subjects?)
- How did the researchers propose to compare the results between the control and experimental groups (i.e. what statistical tests do they plan to use)?

Results:

- 3 most important/interesting results from this study:
 - First
 - Second
 - Third

Discussion:

- What are the 3 most important/interesting conclusions or applications from this study? Why are the results you identified important? What makes them the most interesting or most informative from the data collected? Were some results unexpected? If so, why? *The discussion should continue your train of thought from the important Methods and Results.*
 - First
 - Second
 - Third
- Why do these results matter in the "big picture" -- i.e. what should someone who does not have a college biology background understand about the importance of the results? Why should they care about the results?

AI SUMMARY for C.A.R. project

A. Submission of the article using AI software using the following prompts: - be sure to specifically identify what AI program you used and be sure that the date/time stamp of the AI software is included in your submission. This should include a PDF document of the AI summary (select "Print" when the AI summary is done, select "Save as PDF").

- "Summarize the INTRODUCTION section of the attached article for a college undergraduate science audience."
- "Summarize the METHODS section of the attached article for a college undergraduate science audience."
- "Summarize the RESULTS section of the attached article for a college undergraduate science audience."
- "Summarize the DISCUSSION section of the attached article for a college undergraduate science audience."

B. A one page, 12 pt font, 1" margins evaluation/comparison of your personal summary (following the guidance of the Mid-Hurdle report template) and the AI summary identifying the differences in detail, scope, accuracy, etc.

RESULTS

Positive Perceptions



60% of the students believe Generative AI technologies helped them engage with the process of research writing.



90% of the students believe Generative AI technologies help them while brainstorming while **65%** believe it helps them while editing.



Negative Perceptions

64% of the students believe using Generative AI technologies can create more work.



50% of the students believe using Generative AI technologies to complete assignments undermines the value of a university education.

CONCLUSIONS

Based on student responses to the end-of-quarter survey, there is evidence that:

- ❖ **Students perceive that Generative AI can negatively impact their education** such as **(91%)** of students suggesting they are concerned about how AI impacts critical thinking or **(85%)** who are worried about how it impacts problem solving skills.
- ❖ **However, many students believe AI can be a helpful tool** such as **(60%)** who see value in its use for research writing. While **(77%)** suggested the learning experience was more important than using AI to achieve an outcome (such as completing an assignment), **(32%)** still felt AI wrote better summaries than they could.

ETHICAL CONCERNS	IMPACT (%)	IMPACT LEVEL
Loss of critical thinking skills	91%	High
Loss of problem-solving skills	85%	High
Encourages cheating	55%	Low
Negative impact on human labor	63%	Medium
Negative impact on energy use	72%	Medium
Negative impact on climate change	66%	Medium
Inaccurate authorship	63%	Medium

FUTURE DIRECTIONS

- ❖ This is a preliminary research project evaluating perspectives of student AI use in two different academic programs – Writing and Biological Sciences.
- ❖ The researchers are still in the process of coding the qualitative data from the opening/closing survey and the assignments that incorporated AI.
- ❖ It may be interesting to see what kinds of AI integrated assignments are being required in courses at the University of Denver and whether students perceive these requirements to be contradictory in other courses. Are students in a particular major being asked to use AI while students in another major are being discouraged to use it?

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