2020

Teaching Synthesis

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Introduction

This document was created as part of a faculty co-operative at California State University, Monterey Bay (CSUMB) that focused on how to teach synthesis of information to undergraduate students. This co-op was funded by CSUMB's Center for Teaching, Learning, and Assessment. The co-op members met during Fall 2019 and shared techniques, thoughts, and resources for teaching synthesis. At the conclusion of the co-op, each member contributed a product, whether it be a lesson plan, assignment, prompt, or resource list, to be added to this document and shared with the CSUMB community and beyond.

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Resources on synthesis

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Strategies to consider when teaching synthesis

- Model synthesis for your students verbally by describing several sources of information, how they connect, and what the consensus of the authors is (or your takeaways after reading all of them)
- Provide examples of what good synthesis looks like, either by using examples of student work from previous semesters or finding passages in class readings
- Teach students how to cite multiple sources in a single in-text citation and let them know that they can do this when several sources make the same point (or have similar results, etc.)
- Remind your students that a paragraph with good synthesis would likely include: a topic sentence, ideas from multiple sources that relate to that topic, explicit language showing how those ideas connect, a final sentence addressing what we can take away (or conclude) from these ideas
- Mateos, M., & Solé, I. (2009) found that student work exhibited better synthesis when students spent more time revising their work, and when that revision process included revisiting the sources of information.
    - Build in multiple drafts to your assignments, and provide feedback on synthesis for earlier drafts.
    - See lesson plan for how peers may provide each other feedback on synthesis.
    - Remind students that they don't just read their sources once and then never return to them. It is common/helpful to continue to refer back to sources during the writing process.
- Before students are able to synthesize, they need to read and comprehend their sources, as well as be able to summarize them. These prerequisites to synthesis may need to be addressed as well.
- When writing assignment prompts, be clear about what you want students to do with their sources. Saying "cite 5 sources" can lead to students cherry-picking quotes from sources without even necessarily reading the entire source. If you want students to synthesize, make that clear in the prompt and the grading criteria, and be prepared to explain what synthesis looks like in the context of the assignment.

Teaching materials

- Synthesis table
    - After reading information sources and taking notes, students may use this table to map out how the information from their sources is connected
    - Example of completed table using a social science topic

- Lesson plan
    - Developed by Sarah Dahlen and Ryne Leuzinger for use in upper-division social sciences classes
    - Handout
        - Includes definition of synthesis, key phrases to make connections between sources, and an example paragraph containing synthesis

Readings for students

- Synthesis, from Ashford University's Writing Center
    - Defines synthesis and contrasts it with summarizing
    - Provides example paragraph including synthesis
    - Includes video tutorial directed at upper-level undergrads and grad students
        - Not interactive, but separated into sections for easy navigation
        - About 5 minutes long
        - Reiterates points covered in reading
- Help, I've been asked to synthesize! From Bowling Green State University
    - Provides analogies to help students understand what synthesis is
    - Lists "dos" and "don'ts"
    - Includes an example paragraph
    - Includes minor references to specific classes and assignments, but could easily be adapted

Readings for faculty

- Lundstrom, K., Diekema, A., Leary, H., & Haderlie, S. (2015). Teaching and learning information synthesis: An intervention and rubric based assessment. *Communications in Information Literacy, 9*(1), 60-82.
    - Describes a classroom activity that has students work in groups to read different sources and write a paragraph synthesizing them (see Procedures section, p. 66)
    - Appendices include lesson plan and rubric
- Mateos, M., & Solé, I. (2009). Synthesising information from various texts: A study of procedures and products at different educational levels. *European Journal of Psychology of Education - EJPE (Instituto Superior de Psicologia Aplicada)*, *24*(4), 435–451. https://doi.org/10.1007/BF03178760
    - Review of literature on synthesis
    - Investigated the process students (high school and college in Spain) use to synthesize, and how it becomes more complex at higher levels
    - Note that comprehension is a necessary precursor to synthesis
    - More revision of written work on the part of students leads to better synthesis
- Howard, R. M., Serviss, T., & Rodrigue, T. K. (2010). Writing from Sources, Writing from Sentences. *Writing & Pedagogy, 2*(2), 177–192. https://doi.org/10.1558/wap.v2i2.177
    - While not explicitly about synthesis, this article describes some of the precursors to synthesis that students struggle with, including summarizing information from sources

- Authors find that students aren't writing from their sources but rather writing from specific sentences within the sources
- Note that comprehension of material and non-native language status can contribute to patchwriting

Videos

- Synthesizing information, from GCFLearnFree
  - 2:30 min
  - Simple explanation of synthesis, starting with tying it to students' experiences
  - Doesn't include much "how to" information
- Synthesis tutorial, from Support U
  - Defines synthesis and contrasts it with summarizing
  - Provides example paragraph including synthesis
  - Not interactive, but separated into sections for easy navigation
  - About 5 minutes long
  - Includes description of synthesis matrix (aka synthesis table)
- Writing in APA Format: Finding the Common Denominator, by Mary Lourdes Silva
  - 5:18 min
  - Describes technique for seeing commonalities and differences in sources and expressing these in writing
  - Some APA-specific examples are used, but mostly applicable to writing in any style

Tutorials and activities

- Synthesizing activity 1, from Excelsior College Online Reading Lab
  - Students read short passages, then drag and drop possible sentence completers to summarize the passage and then add their thoughts on the topic
  - The exercises are scaffolded, first looking at single passages and moving on two synthesizing two passages
  - The interface checks their answers for correctness. The final score can be captured via screenshot and submitted to an instructor.
- Synthesizing activity 2, from Excelsior College Online Reading Lab
  - Students read short passages and complete sentences that summarize the passage and prompt the student to supply their thoughts on the topic
  - The exercises are scaffolded, first writing about single passages and moving on two writing about two passages
  - Students can create document of their work in the tutorial if they need to submit it for credit
- Synthesizing practice, from IEU
  - This activity handout shows steps of writing a paragraph synthesizing information from three sources

- Could be used as an activity by removing suggested answers from second and third practice example
- General layout and steps could be adapted for different subject areas

Information Synthesis Group Activity

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Adapted from Lundstrom, Diekema, Leary, Haderlie, and Holliday (2015, p. 66-67).

In the Lundstrom et al. (2015) article, the group activity follows a lecture and whole-class discussion led by an instructor.

Purpose

This activity will give students practice *synthesizing* information from a variety of sources that share a common topic as their focus. **"Synthesis" is defined as the act of integrating information from multiple sources to create a whole that offers new meaning or insight on a topic.** It is embedded into the learning outcomes for GE Area A2 and GWAR courses, and has been identified by employers as an important but "exceptional" skill among recent graduates (Head, Van Hoeck, Eschler, & Fullerton, 2013). Meaningful synthesis requires writers to first comprehend and be able to summarize sources, so this activity will also give students some practice reading sources and stating their main ideas in their own words.

Task

CLASS SESSION 1 -- Students are placed into groups of three. Each group is provided the following four articles:

A) Should We Worry about Filter Bubbles? (academic journal article from *Internet Policy Review*)

B) Search Engine Bias (article from Encyclopedia of *Social Media and Politics*)

C) How Companies Learn Your Secrets (article from *New York Times Magazine*)

D) Algorithmic Bias Detection and Mitigation: Best Practices and Policies to Reduce Consumer Harms (research report from The Brookings Institution)

Note: Students in A2 classes who have completed an information literacy instruction session with a librarian will have had prior experience with one or more of the above articles, in the context of an activity focused on evaluating information for authority.

HOMEWORK -- Each student reads two articles. All students read Article A. One student from each group reads Article B, another student in the same group reads Article C, and the third student in the group

reads article D. After reading each article, the student should go back and highlight or note in their own words that articles main ideas (each article will likely have 3-6 main ideas).

CLASS SESSION 2 -- Students bring their articles, with main ideas identified, to class. Each group is given a pack of sticky notes. Each student writes each of the main ideas from their two articles, along with a succinct indication of which article the main idea comes from, on a separate sticky note (so a student with five main ideas per each of two articles would generate 10 sticky notes). Students then examine all the sticky notes generated by their group, and work together to create clusters of sticky notes containing similar main ideas or main ideas that address more or less the same topic. Finally, each student chooses a sticky note cluster and individually writes a paragraph that attempts to synthesize the main ideas within that cluster. Students then share and discuss their paragraphs with their groups and/or report out to the class, attending to connections they were able to make and new insights or meaning they were able to create through integrating the main ideas of the group's various sources into a synthesized paragraph.

References

Head, A.J., Van Hoeck, M., Eschler, J., & Fullerton, S. (2013). What information competencies matter in today's workplace? *Library and Information Research, 37* (114), 74-104.

Lundstrom, K., Diekema, A. R., Leary, H., Haderlie, S., & Holliday, W. (2015). Teaching and Learning Information Synthesis: An Intervention and Rubric Based Assessment. *Communications in Information Literacy, 9* (1), 60-82. https://doi.org/10.15760/ comminfolit.2015.9.1.176

CHSHS Course Mapping - Information Literacy Library Sessions

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The objective of this exercise is to map information literacy learning outcomes onto curricular learning outcomes across the various majors in the College of Health Sciences & Human Services. This exercise supports the scaffolding of the various levels of engagement that students are expected to meet throughout each program, which can be identified as part of a program review process. These levels are introduction, development, mastery, and assessment.

As an example, I have developed information literacy learning outcomes based on a combination of A2 and B3 GE learning outcomes:

- Students will search in appropriate library databases.
- Students will identify peer-reviewed articles on the topic.
- Students will evaluate the credibility and value of different sources of information.
- Students will integrate own ideas with those from appropriate sources.
- Students will attribute information to sources.

As part of the assessment of information literacy learning outcomes focused on synthesis (students will integrate own ideas with those from appropriate sources), I propose the adoption of a synthesis rubric developed by Lundstrom, Diekema, Leary, Haderlie, and Holliday (2015, p. 81).

Synthesis Rubric

Focus	**Not present = 0**	**Needs improvement = 1**	**Developing = 2**	**Advanced = 3**
Source variety	Does not use multiple sources (<2). Sources do not need to be in a reference list any mention of any outside source works.	Uses a few different sources, but with little variation (1 source of variation) in perspective, trending toward the same view. Sources do not need to be in a reference list; any mention of any outside source works.	Uses a variety of sources that cover some of the differing perspectives (2 or more perspectives). Sources do not need to be in a reference list; any mention of any outside source works.	Uses multiple sources which address multiple perspectives, including opposing viewpoints. Sources do not need to be in a reference list; any mention of any outside source works.

Using sources effectively	Does not present information from sources. No in-text citations present.	Uses information from sources with no added value, with little or no summary - used only as support (haphazard, provide too much or too little information, and/or serve no clear purpose).	Uses information from sources through direct quotes and/or paraphrasing and begins to summarize main ideas (making main ideas more clear and succinct; implicit connections to the thesis or main ideas of the paper).	Uses information from sources through direct quotes when necessary, paraphrasing, summarizing, and explicit connections (making the main ideas clear, succinct, and connected to the thesis or main ideas in the paper).
Identifies conversations from different sources	No or very weak connections are made between sources. The reader cannot see how the sources are related to each other.	Few implicit connections are made between sources. Similarities, differences, relationships and patterns are rarely identified so it is difficult for the reader to see how the sources are related.	There are some explicit connections between sources (textual indicators or side by side in paragraph connections). Similarities, differences, relationships, and patterns are sometimes, but not consistently, identified so the reader can see how some of the sources are related.	There are several explicit connections between sources including connections between contradictory sources. Similarities, differences, relationships, and patterns are almost always identified so the reader can see how the sources are related and how they support the thesis.
Organizes sources effectively	Does not use any information from sources and lacks organization.	Uses information from sources and attempts to organize information but the organization is not effective in revealing important patterns, differences or similarities. (AACU)	Uses information from sources and effectively organizes information to reveal some important patterns, differences or similarities to focus. (AACU)	Uses information from sources and effectively organizes information to reveal insightful patterns, differences, or similarities related to focus. (AACU)

Analyzes sources to create something new	No conclusions or generalizations offered (Evergreen). Author does not attempt to make sense of the information he/she uses.	The relationship between the ideas in sources and the author's conclusions or implicit generalizations are assumed or unclear.	The author uses information sources to come to some Reasonable generalizations or well reasoned conclusions. (Ford, T.)	The author relates knowledge from several areas/sources of information in order to demonstrate comprehension, make insightful analyses, and draw clear conclusions.

For an example of how synthesis can be discussed in an information literacy session, I have incorporated an activity into the lesson outline for NURS 430. The activity was developed by Lundstrom, Diekema, Leary, Haderlie, and Holliday (2015, p. 66-69), and asks students to use colored sticky notes to identify common themes across various information sources. In NURS 300, students have been introduced to searching in appropriate library databases, identifying peer-reviewed articles on the topic, evaluating the credibility and value of different sources of information, integrating own ideas with those from appropriate sources, and attributing information to sources. In NURS 310 and 330, students are continuing to develop these skills. In NURS 395 and NURS 430, students are expected to master these skills and these skills are being assessed at the mastery level.

NURS 430 Library Session Learning Outcomes and Session Outline (See Appendix A)

- Students will search in appropriate library databases.
    - Through the review of the Nursing Research Guide - Articles and Databases page
- Students will identify peer-reviewed articles on the topic.
    - Through the Personal Research - Personal Search activity
- Students will evaluate the credibility and value of different sources of information.
    - Through the sharing part of the Personal Research - Group Work activity
- Students will integrate own ideas with those from appropriate sources.
    - Through the use of sticky note exercise as part of the Personal Research - Group Work activity
- Students will attribute information to sources.
    - Through the review of the Nursing Research Guide - Citations (APA Style) page

References

Lundstrom, K., Diekema, A. R., Leary, H., Haderlie, S., & Holliday, W. (2015). Teaching and Learning Information Synthesis: An Intervention and Rubric Based Assessment. *Communications in Information Literacy, 9(1)*, 60-82. https://doi.org/10.15760/ comminfolit.2015.9.1.176

Appendix A: NURS 430 Instruction Outline - Spring 2020

Arrival (10 mins)

- Introduce myself as the library liaison to the College of Health Sciences and Human Services
- Answer any general library questions
- Ask the following questions to get a better understanding of what students already know:
    - How many of you have had library instruction in a NURS course before today?
    - What did you learn from any previous library instruction?
- Refer to the library session's agenda
- Discuss the course description and how information literacy applies to it
- Discuss the library session's learning outcomes
- Ask the following questions to tie the library session to the assignment that the students are working on:
    - What is your research topic?
    - What do you want to research?
    - What are some possible research topics?

Evidence-Based Practice (10 minutes)

- What is Evidence-based Practice?
    - Have students generate research questions that involve 1-2 parts of a PICOT framework
        - Population, Intervention, Comparison, Outcome, Time
    - Remind students about the following practices to search for the best evidence
        - Search multiple databases
        - Use database's controlled vocabulary
        - Combine searches and search terms
        - Use search facets and limiters

Library Resources (10 mins)

- Review the Nursing Research Guide
    - Review the Articles and Databases page
        - CINAHL
        - Cochrane Library
        - National Guideline Clearinghouse
        - PubMed
            - Peer-reviewed journal articles; may be open access or provided by CSUMB.
    - Review the Books and Background Reading page
        - Course Reserve - Users can check out course reserve items for up to two hours.

        - Book Stacks/Electronic Books - Users can check out books in the stacks and some electronic books.
        - GVRL - Users can find background information and keywords to be used to do research.
        - ILL - Users can request books, DVDs, and journal articles from other libraries.
    - Review the Websites page
        - California and National Sites
    - Review the Citations (APA Style) page

Personal Research by Group (70 minutes)

- Have students work with their group to:
    - identify peer-reviewed articles on the topic
    - evaluate the credibility and value of different sources of information
    - integrate own ideas with those from appropriate sources
- Share a definition and example of synthesis
- Have students individually conduct research on their topic
- Once each group member has found one article, share a summary of found article with their group
- Have students find common themes that are present in multiple articles using colored sticky notes
    - Have students use the same color for each theme
- Have students write one sentence synthesizing each theme
    - Have each group add to the PowerPoint presentation
- Share each group's work
- If time is available, continue conducting personal research

Conclusion (10 mins)

- Review what was covered in the library session
- Review the Ask a Librarian page
- Review the contact information section on the Nursing Research Guide
- Have students complete the teaching assessment survey

FYS 156: Purposes of Liberal Education Assignment

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Objectives:

- Distinguish between a liberal education and other approaches to education or training
- Support your reasons for your **personal** educational goal in terms of the qualities of a liberal education
- Given criteria for an educated person, and a graduate's reflection on the value of a CSUMB degree, predict how they may apply to your personal learning experience over the next few years

Resources:

- Welcome Brochure (in iLearn)
- AAC&U Web page at: https://www.aacu.org/leap/what-is-a-liberal-education
- "Whither the Liberal Arts" from the Monterey County *Herald*
- "The Unexpected Value of the Liberal Arts" from *The Atlantic*
- Henry Rosovsky excerpt from *The University: An Owner's Manual*

YOUR TASK: Read the above documents, with special attention in the last item (Rosovsky) to the **five criteria for an educated person.** Then write about how a liberal (and/or liberal arts) education at a "comprehensive university" (e.g., CSUMB) may apply to **you**. Consider the following in your full response:

1. What is a liberal or liberal arts education, and why would you personally choose to pursue this goal instead of another type of education or training? Use **common ideas or concepts** from the Welcome Brochure, the AAC&U Web page linked above, the *Herald* article, and the *Atlantic* article to support your response.
2. How does Cory's remark from 1861, quoted at length in the Rosovsky excerpt, apply to Rosovsky's five criteria?
3. How might **each** of Rosovsky's five criteria, published more than 30 years ago, apply to you **personally** while you are a student at CSUMB?
4. Using principles from the resources provided, describe **in detail** how you will continue your educational development through the next academic year.

Length: About 500 words but answer thoroughly, and go longer if need be

Format: **Spell/grammar-checked** Google Doc, Word doc, or PDF

DUE: [date]
[Supports FYS Outcomes 1, 2]

BUS 468: Business Analytics, Project Guidelines

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About the course

In this course called Business Analytics (BA), students are engaged in the practice of iterative, methodical exploration of a "big" data with emphasis on statistical and operational analysis along with the execution of scientific research. The course includes data mining, predictive analytics, applied analytics, and statistics. Students explore BA capabilities using software tools such as Base SAS, SAS Enterprise Miner, SAS Visual Analytics, MicroStrategy, JMP, and Tableau. In the process of exploring the "big" data using SAS, JMP, Tableau and other statistical tools, students have a good knowledge of statistical methods such as measures of central tendency, measures of variability, regression, chi-square, ANOVA, t-test, and z-score. Students learn data exploration techniques to tell stories supported by the data. Basic statistical procedures such as hypothesis testing are taught in the class and practiced by the students.

Project guidelines

Background:

The idea of this project is for students to work in groups to write an empirical scientific research paper. Students work in a group of 4 to analyze a dataset given to them. Each group will be working on a different dataset but all with the themes revolving around social media, education, and poverty. The instructor will provide these datasets to the group (source of the datasets is the American Community Survey). The instructor will also provide the groups with an example of how a research paper would look. The group members should be aware of this research paper (or similar ones) as it would be discussed in one of the classes of the course. The group project is due in phases. However, a final copy of each phase, put together as combined scientific research, should be presented in Phase 6.

Phase 1 (10%):

In phase 1, each group will explore the basics of the data to understand its metadata, including the fields associated with it, so that they are aware of what is given to them. Each group will come up with the stories they want to tell with the data. They will write down at least three of the stories (problem statements/hypothesis). After that, they will perform the basic literature review to find if the stories/problem statements/hypothesis that they created are:

- important (to academic, real-world)
- unique (not researched at past) or adds newer value to existing knowledge

If the topic and problem statement they chose aren't unique and important, they would go back to revise it until they are satisfied. Groups should use "Google Scholar" or the databases that our library has to find peer-reviewed journals on a similar topic. Groups should take help from the instructor, too, if required. Some examples of the research stories or topics can be:

A. The impact of social media on the grades of high school students - A gender-based study
B. An exploration of ethnicity and poverty groups in an urban school district
C. LGBT community and usage of social media

Now, once you find a unique topic or a topic on which you believe can add value/knowledge to existing literature (where you see the existing research gap), you would write an Introduction part summarizing the points mentioned above. Your introduction portion (as a submission for Phase 1) should look like this. The introduction section should be no more than one and a half pages, single line spacing, 12 font-size, Times New Roman, APA format. A Word document should be uploaded in iLearn for this phase.

Phase 2 (10%):

The second phase is about the literature review where you synthesize the findings of previous literature. Your group would analyze and evaluate existing literature to see what already exists. A literature summary of what has been done and what can further be done with the gap that exists will have to be written down. Students will have to recognize the pattern that exists in the previously published research studies related to this field and see similarities, differences, and unique instances. Each group will also try to critically analyze the literature to see what these studies are currently missing based on the pattern. Each group will synthesize what they learned, and what they believe they can contribute. They will put together their findings in a table based on a thematic grouping (i.e. theme-based categories). Each group will share this in the class – they will get feedback from each other and modify their story to be specific to the research gap that exists (if required). Please remember that citations of several sources alone are not a literature review. The resources you put together from your readings have to be related, in your own words, showing the transition of your ideas and your views on the topic. It should be a synthesis and analysis of information presented on these sources. Here is a very good example of how information from several literature reviews can be synthesized (slide 18 and above are especially important). Your literature portion (as a submission for Phase 2) should look like this. The literature review section should be no more than four pages, single line spacing, 12 font-size, Times New Roman, APA format. A table like the one shown in the example is a good way to proceed ahead. The focus should be on synthesizing information - building on what one literature borrows from others to grow and build on it. If you aren't aware of the difference between synthesizing and summarizing, please view this video. A word document should be uploaded in iLearn for this phase - please make sure that the information you presented about phase 1 should be there (do not remove it).

Phase 3 (10%):

Each group will now come up with their hypotheses (at least three) that create their research model. Each hypothesis should be supported by previous literature and be developed on it. Again, synthesizing

(and not summarizing) the information is important. Your hypotheses section should look like this. This Theory and Hypotheses section should be no more than two pages, single line spacing, 12 font-size, Times New Roman, APA format. A word document should be uploaded in iLearn for this phase - please make sure that the information you presented about phase 2 should be there (do not remove it).

Phase 4 (10%):

In this phase, groups would dive into the data and perform an exploratory analysis of it. They will try to prove the hypotheses that they created in Phase 1 using regression, ANOVA, t-test, z-score, chi-square, correlation, measures of variability, or a mix of any of these statistical methods using SAS, Tableau, Microstrategy. They will write a report on the findings based on the data analysis. Your data analysis and findings section should look like this. This section should be no more than three pages, single line spacing, 12 font-size, Times New Roman, APA format. A word document should be uploaded in iLearn for this phase - please make sure that the information you presented about phase 3 should be there (do not remove it). All supporting output received from running the statistical tools should be included in an organized fashion as a part of the Appendix. Also, the output derived from the statistical tool (such as SAS, Tableau, etc), should be uploaded as well (in iLearn).

Phase 5 (10%):

In this phase (discussion section), the groups would synthesize their findings, compare it with the previous research, discuss the contributions made, explain limitations of your research as compared to others, future research opportunities and conclude their paper. Your discussion section should look like this. The discussion section should be no more than two pages, single line spacing, 12 font-size, Times New Roman, APA format.

Phase 6 (50%):

In phase 6, each group is making the presentation (about 20 minutes of presentation, 5 minutes of Q&A from other students/instructors) based on the final report of the group. Each group would submit a full paper starting from phase 1 to phase 5 - this full paper must be a revised research paper based on the feedback provided by the instructor as of now (and other groups, if any). A revised paper based on the feedback is a requirement - each of the phases of the report should have been changed, revised, and rewritten as required by the feedback.

Separate from this group project is an individual assignment related to this project. Each student would also submit an assignment about what they learned from other groups in relation to their project. Based on the presentations they listened to (from other groups), each student would write if the findings of their group are complementary or conflicting in nature with other groups that have similar research projects (if any). This one-page synthesis should be submitted as an individual assignment by each student after a week of Phase 6 (and is graded as a separate assignment).

Due dates and report format

1. The report should follow a scientific report format that can be published in peer-reviewed journals or conferences. The objective is to have a final updated paper that can be sent to a conference or journal for publication. The group should follow APA format with single line spacing, 12 font-size, Times New Roman.
2. Each phase has its own due date. For example, phase 1 has its own due date that comes before Phase 2 and so on. Please see iLearn for more details regarding the due date of each phase.
3. Phase 6 is where students present their final project to the class and provide an updated project report to the instructor (incorporating feedback provided by the Instructor during those phases). The presentation should be 20 minutes with 5 minutes of Q&A from the students and instructor. Please prepare accordingly.

Grading criteria

The grading of this project (especially phase 6) would be based on the following but may go beyond it depending on the interaction of the faculty with each group during the semester. As much as the output is valued for grading, the process to reach there is equally taken into consideration while grading. Thus, taking constant help from the instructor, asking for feedback in class, exploring different statistical methods, etc. are good ingredients for a better grade:

1. Quality of content:
    - How advanced is the topic selected in terms of the contribution to the existing knowledge and literature? Is the topic unique as asked? Does it add value to the existing research gap?
    - How well has your team incorporated the learning from the course?
    - How useful would your report and presentation be to a business professional?
2. Synthesizing Information and Critical Analysis:
    - Copying online content and pasting is not what this project is asking. Students who critically analyze and present their views in the report and presentation (instead of just summarizing contents from the Internet) would receive relatively a better grade.
    - The depth of the analysis matters as much as the breadth of it (if not more).
    - Synthesizing several of the existing literature related to the context of your research is a must.
    - A well thought out hypothesis gets a better grade.
3. Quality of data analysis:
    - Were most of the statistical procedures and methods learned in the class used in this paper? Were all the possible stories explored?
    - Were correct statistical procedures used?
    - Were data analysis explained in detail? Presenting output and not explaining your reasoning for the outcome or finding gets a lower grade.
4. Quality of writing:
    - Does the paper mirror scientific research articles? Clarity of expression, free of grammatical, spelling, and logical errors, easy to understand the style of writing, use of headings, page numbers, cover sheet, follow APA format, etc. are some other criteria.

5. Presentations:

- How well were the team prepared in terms of resources to show/present, agenda, and other resources such as handout if required? Did they use the given time period well?
- How well did the team present their team project to the class in terms of clarity, confidence, storytelling?
- How engaging and confident was the group?
- How well did they handle the Q&A?

CST 302: Group Activity - Information Synthesis

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Introduction:
Writing a paper or creating a design with a strong research foundation, requires the ability to synthesize information (verbal/visual) from multiple sources. Therefore, it is important to formally introduce undergraduate students to the concepts and techniques of information synthesis.

Example: History of Communication Design CST 302 - Final Project
In the final project of the History of Communication class that I teach, students are required to work as groups to write an essay about one of the topics covered through the class, and support the essay with an infographic timeline graphic design piece. The students will be directed to apply the following:

A) Essay about one of the topics covered through the class
i.e. The change and development of typography over time, Bauhaus designers' style and works.

- Use color codes to highlight the similar information through your sources (**info. synthesis**).
- Use the provided MLA template (style, format, type size...).
- The essay should be 5 - 7 pages including the sources citation page.
- The document name should be the topic title you choose.

B) Timeline infographic poster/animation
i.e. Infographic timeline showing the change and development of typography for topic 1 example.

- Start with creating mood board for inspiration and planning the design (**visual synthesis**).
- Designs should demonstrate creativity and skills using graphic design software.
- Designs may be introduced in different mediums (i.e. poster and movie or animation).

Evaluation Criteria:

- **Essay**
  - Research thoroughness, and content accuracy.
  - Sources credibility, synthesis, and citation.
  - Format and styling (following the MLA template).
  - Writing quality:
    - Focus: The essay has a single clear topic. Paragraphs have a clear main point.
    - Development: Paragraphs support and expand the essay topic through detail.
    - Unity: The essay is well structured to support the main topic.
    - Coherence: The essay is logically organized, flow smoothly, and "sticks" together.
    - Correctness: Correct English, with complete sentences, and spelling error-free.

- **Infographic Designs** (poster/interactive media/video)
  - Data/Information analysis and synthesis based on the research conducted.
  - Creative concepts, and clarity to communicate the contents.
  - Design originality (no copyright violations), and aesthetics considerations.
  - Artwork execution quality (images/graphics resolution, format appropriateness...).