

Faculty-friendly Problem-Based Writing Assignments to Enhance Students' Growth as Disciplinary Thinkers

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"[Highly effective teachers confront students with] intriguing, beautiful, or important problems, authentic tasks that will challenge them to grapple with ideas, rethink their assumptions, and examine their mental models of reality" (p.18).

Ken Bain. *What the Best College Teachers Do*. Cambridge: Harvard University Press, 2004.

"[These scholars] conclude, after extensive research in the nature of expertise in many domains of knowledge, that the single most distinguishing characteristic of those who gain expertise in a variety of skills domains are those who continually assign themselves more and more complex problems to solve. For educators this translates to a need for students to experience sequenced writing assignments within and across courses in which skills required to complete the task build upon previously acquired skills."

Anne Beaufort. *College Writing and Beyond: A New framework for University Writing Instruction*. Logan, UT: Utah State University Press, 2007: 184

"Design assignments for the curriculum rather than the individual course"

Moskovitz, Cary and David Kellogg. "Inquiry-Based Writing in the Laboratory Course." *Nature* 334 (20 May 2011): 919-920

DEVELOPMENT OF STUDENTS' WRITING SKILLS: NOVICE TO EXPERT

MacDonald's Stages of Development: Novice to Expert

USA	Canada
<p>Stage 1 [what students bring from high school]: Nonacademic or pseudo-academic writing</p> <p>Stage 2 [goal of first-year composition]: Generalized academic writing concerned with stating claims, offering evidence, respecting others' opinions, and learning how to write with authority.</p> <p>Stage 3 [early courses in major]: Novice approximations of particular disciplinary ways of making knowledge.</p> <p>Stage 4 [advanced courses in major]: Expert, insider prose within a discipline [defined appropriately for undergraduates]</p>	<p>Students go directly from high school into stage 3</p>

Adapted from Susan Peck MacDonald, Professional Writing in the Humanities and Social Sciences. Carbondale, Southern Illinois UP, 1994 (p. 187)

Possible Forms of Expert, Insider Prose for Undergraduates (to be determined by disciplinary faculty)

- Academic or scholarly writing in the discipline (for example, a senior paper suitable for presentation at an undergraduate research conference)
- Professional workplace writing (proposals, reports, memos, technical papers, or other disciplinary kinds of professional writing)
- Civic or public argument on local or national issues related to the discipline
- Other kinds of writing or communication projects specific to a major or discipline (posters, creative projects, Web sites, multi-media presentations, PowerPoint presentations, and so forth)

Prototype assessment project: (1) A teacher embeds an “expert insider prose” assignment in a senior-level course. (2) The teacher grades the papers using a rubric, identifies the percentage of strong, OK, and weak/unsatisfactory papers, and analyzes characteristic strengths and weaknesses. (3) The teacher presents the results at a department meeting and leads discussion of problems that may be ameliorated by better assignments, instructional methods, and emphases earlier in the curriculum. (4) The department agrees to pilot some changes in the next year (“closing the loop”).

Walvoord, B. and Anderson, V. *Effective grading: A Tool for Learning and Assessment*. 2nd Ed. San Francisco: Jossey-Bass. 2009

Bean, J. C., Carrithers, D. and Earenfight, T. “Transforming WAC through a Discourse-Based Approach to University Outcomes Assessment.” *WAC Journal: Writing Across the Curriculum*, 16 (2005): 5-21.

KNOWLEDGE/SKILLS NEEDED FOR “EXPERT INSIDER PROSE”

The following diagram is reproduced with permission from Anne Beaufort in *College Writing and Beyond: A New Framework for University Writing Instruction*. Logan UT: Utah State University Press, 2007, p. 19.

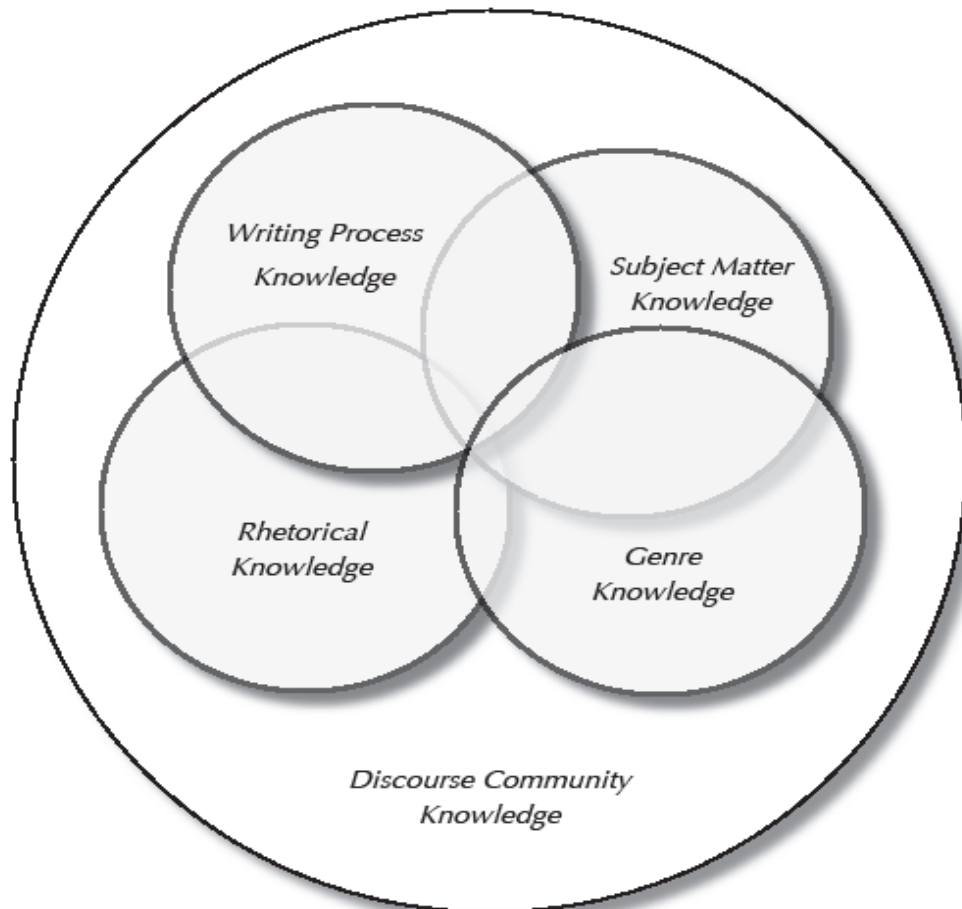


Figure 1 Conceptual Model: Expert Writers Draw on Five Knowledge Domains

Five interrelated key knowledge domains inform the cognitive processes of expert writers as they compose. Discourse community knowledge is the broad overarching domain which informs each of the other knowledge domains essential to composing.

Social Work DRAFT Curriculum for Required Major Courses

<p>SOCW 250 Introduction to Social Work</p>	<p>Goal: Read research for knowledge and accurately summarize scholarly research in the field of social work. Assignment: Annotated Bibliography of 5 articles using APA style on an area of interest within the field of social work Learning Activities: Require Perrin’s Pocket Guide to APA - Arrange instruction session with library liaison - Exposure to Social Work scholarly research journals- Provide an opportunity for practice of skills (understanding & summarizing) in class.</p>
<p>SOCW 301 Human Development and Social Work</p>	<p>Goal: Begin thematic grouping of selected articles with developed thesis statement. Linkage of social problem with course content on human development. Assignment: Choose an area of concern (i.e., Impact of divorce) which intersects with a life stage (i.e., adolescence) and write a short literature review utilizing and citing 5 scholarly-peer reviewed articles.(Consider giving a choice of areas) Learning activities: Review APA formatting, appropriate sources</p>
<p>SOCW 304 Contemporary Social Policy</p>	<p>Goal: Critical analysis of current social policy Assignment: Develop a Policy brief Learning Activities: Participation in NASW Lobby Day in Olympia- Write letter to the editor - Understand the components of a policy brief</p>
<p>SOCW 410 Practice II: Social Work with Groups</p>	<p>Goal: Linkage of scholarly research on a social problem with social work practice method. Develop a group proposal as if submitting to an agency for development. Assignment: Write and present a group proposal for a task or treatment group for a population served at a community social service or health care agency containing - Literature review on the social problem and treatment modality - Group description: purpose, goals, agency sponsorship, membership, recruitment; Group structure: chemises, topics; method of Evaluation; References</p>
<p>SOCW 490 Research III: Capstone</p>	<p>Goals: Evaluate a component of BSW seniors’ field practice through knowledge gained from course work on theory, practice, assessment, and empirically-based published research. Mastery of the human subjects ethics review process – and writing for the review process. This synthesis of students’ social work education is presented orally to peers, professors, and field faculty. Assignment: Capstone paper - Senior research project/paper includes abstract, literature review, description of assessment method, demonstration of assessment & theory application from coursework, design and carry out evaluation component, and summary of findings and conclusion. Learning activities: Preparation of an IRB application for departmental review; weekly submission of drafts and revisions of drafts of the sections of the final product. Oral presentation skill practice.</p>

TEACHING CRITICAL THINKING IN FINANCE

Assessment task: Senior finance majors in a capstone course were given a case problem in which they played the role of financial advisor to husband and wife clients faced with an investment dilemma. The retiring couple were considering two choices for investing the wife's lump sum payment (\$155,673.53) from a 401 K plan.

- *Choice A:* Buy an "Immediate Single-Life Annuity" which promises a monthly payment of \$1225.85 for the rest of her life and a lump sum payout to a designated survivor of \$37,000.
- *Choice B:* Invest the lump sum in a growth mutual fund which was yielding 10 percent annual return at the time (the case study was developed in 2000). At 10 percent, the plan would pay the same \$1225.85 but return the original principle at time of the wife's death.

Students were given the following task: *You have crunched the numbers on the two plans, analyzed the results, and begun to formulate some conclusions and advice. Write a 2-3 page memo to David and Marilyn in which you analyze the benefits and risks of each plan and offer advice on how they can make a decision. Explain to David and Marilyn the different methods of analysis you used, why you used them, and what useful information each method revealed. Attach to your memo any visuals or graphics that would be useful to them in comparing the two plans. Note that David and Marilyn are well-educated college graduates but they have no background in finance.* (Assignment developed by Professor David Carrithers in consultation with finance faculty.)

Method: Members of the finance faculty met to develop a rubric for scoring the memos and then to staff-grade them. Following the grading, the department held a detailed discussion of their findings.

Findings:

- Approximately half of the students scored in a range which the faculty consider cause for concern while even top-half students showed considerable critical thinking weaknesses
- Almost all students used tools and methodologies covered in the finance curriculum (NPV analysis, calculating an IRR, etc.) but many students used them randomly, often applying them to extraneous data, and revealing no purpose or goal in the calculation
- Many students failed to address the client's problem and provide the requested financial counsel
- Many student were unable to translate finance concepts/methods into lay language
- Generally students failed to construct rhetorically useful graphics

Departmental Efforts to Improve Curriculum and Instruction:

- Finance faculty realized that in finance courses students were typically assigned algorithmic homework sets teaching use of mathematical tools (formula-based problems or quantitative story problems—"well-structured" problems with "right answers")
- Faculty are developing methods to place more ill-structured problems into these earlier courses through writing assignments or small group activities requiring group speakers to present extended arguments in support of solutions
- Faculty are developing assignments requiring students to create rhetorically effective graphics for a specified audience and purpose.
- Faculty are developing written and oral assignments that require students to address lay audiences.
- Overall goal is more balanced attention to mastery of both algorithmic tools and the "big-picture" ability to construct finance arguments

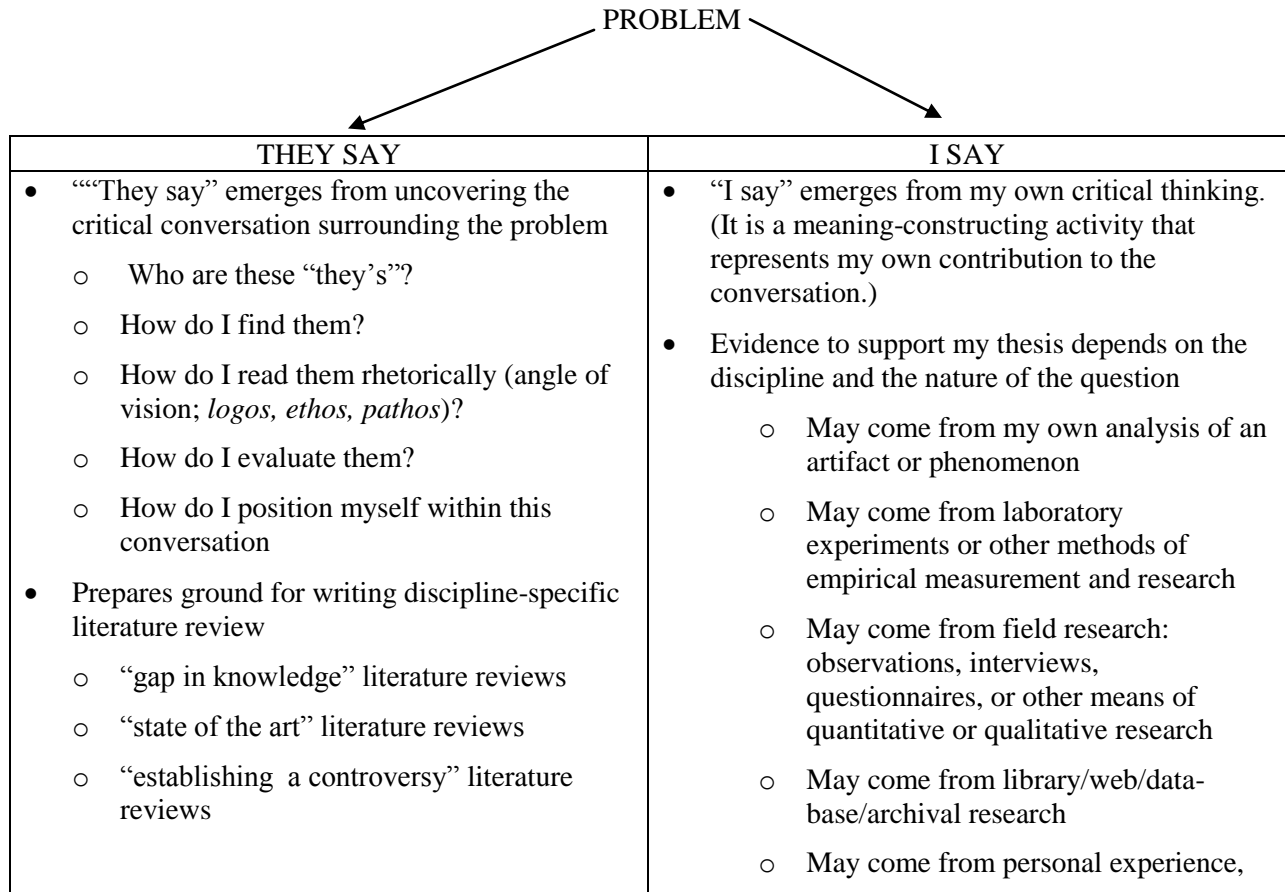
Details of this project can be found in the following publications:

- Carithers, D., J.C. Bean, and T. Ling. (June, 2008). Messy problems and lay audiences: Teaching critical thinking within the finance curriculum." *Business Communication Quarterly*: 152-170.
- Carrithers, D. and J. C. Bean. (March 2008) Using a client memo to assess critical thinking of finance majors. *Business Communication Quarterly*. 71.1 (March 2008): 10-26.

TEACHING THE “BIG PICTURE” MOVES OF ACADEMIC ARGUMENT

- Academic writing is initiated by a problem (either one assigned by the instructor or developed by the student)
- In a prototype academic paper in any discipline, the introduction explains the problem-at-issue, positions the paper in a conversation, and motivates the reader by showing the problem’s significance. (The length of an introduction is a function of how much the reader already knows about and cares about the problem)
- A thesis statement is in tension with some kind of counter-thesis, alternative viewpoint, or possibly different “answer” to the thesis-question (what Graff and Birkenstein have called “They say/I say”)

. *Gerald Graff and Cathy Birkenstein. 2006. *“They Say/I Say”: The Moves that Matter in Academic Writing*. New York: Norton



Discussion time: Share with a neighbor your responses to the following questions:

1. How do students learn the “they say/ I say” moves in your discipline?
2. What would constitute “expert insider prose” for a senior undergraduate in your discipline?
3. Does your department currently have a plan for teaching the skills and knowledge needed for expert insider prose (see Anne Beaufort chart, p. 3)

SOME GENERAL PRINCIPLES FOR TEACHING ACADEMIC WRITING IN THE DISCIPLINES

1. Establish your course goals (often stated in syllabus as learning outcomes)

- subject matter goals—the new knowledge (facts, concepts, theories, methods) that you want students to learn
- goals for thinking within the discipline—new ways that you want students to see or think: disciplinary processes of critical thinking, inquiry, reading, analysis, and argument

2. Design critical thinking problems connected to your course goals.

- Problems should stimulate interest, require use of subject matter knowledge, and teach disciplinary ways of thinking, analyzing, and arguing
- Highest level of critical thinking typically comes from “messy,” “ill-structured,” or open-ended problems with no algorithmically attained “right answer”—problems that lead to a claim with supporting arguments.

3. Develop a repertoire of ways to give critical thinking problems to students

- Thought provokers for informal exploratory writing (in-class freewrites; short “thinking pieces”; posts to course discussion boards; blog posts; other kinds of informal, low stakes writing)
- Very short formal assignments (less than a page) –sometimes called microthemes
- Short (2-3 page) formal assignments, often used as scaffolding for longer assignments
- Longer, formal writing assignments often requiring research
- Tasks for small-group problem solving, debates, or whole-class discussion
- Essay exam questions or practice exam questions

4. Think of writing assignments as a crucial part of course design

- “Reverse engineer” your course by designing the final assignment first (“backward design”)
- Create earlier assignments that develop the skills needed for the final assignment (sometimes called “scaffolding assignments”)
- Consider adding informal low-stakes writing to help students explore ideas and promote learning
- When designing a formal assignment, create or simulate an authentic rhetorical context: purpose, audience, and genre (avoid “school genres” such as “research paper” or “lab report”)
- Help students understand the rhetorical function of titles and introductions by asking them to assume that their readers haven’t read the assignment

5. When assigning formal writing, treat writing as a process

- Provide opportunities for exploration of ideas prior to drafting (low stakes writing, class discussion, small group brainstorming)
- Encourage imperfect first drafts
- Stress substantial revision reflecting increased complexity and elaboration of thought and increased awareness of readers’ needs
- Where possible, allow rewrites; write comments that encourage revision and that emphasize the higher order concerns of ideas, thought content, organization, and development
- Consider instituting peer review workshops and encourage use of campus writing center

6. Develop scoring criteria and give them to students in advance

- simple numerical or +/check/- scales for exploratory writing
- rubrics for formal writing

IDENTIFYING A DIFFICULT CONCEPT, THINKING SKILL, OR “WAY OF SEEING OR READING” IN YOUR COURSE

Intra- and intermolecular interactions: Focus groups revealed that many students had superficial, memorized, or incorrect understanding of the physical and chemical basis of non-covalent interactions such as hydrogen bonds, dipole-dipole interactions, and van der Waals interactions. Many students could name the interactions and some could discuss the role of polarizable electron clouds in these interactions, but most struggled to make generalizations about the electrostatic basis of the interactions and many did not feel confident in making predictions about interactions in complex macromolecules [from : “Identification of threshold concepts for biochemistry” Jennifer Loertscher, David Green, Jennifer E. Lewis, Vicky Minderhout, and Sara Lin. [manuscript under review]—NSF SoTL research project at Seattle University

Background: Think about particularly difficult aspects of one of your courses. For example, identify one or more concepts that students have trouble learning. At one level, students *seem* to learn the concept (e.g., they can say the language, they can repeat the right words, they have memorized its key features) but at a deeper level they don’t quite grasp it. Or identify particular kinds of thinking skills or ways of seeing or reading that you are trying to teach in your course.

Task: Please write for five minutes about one or more aspects of your course that are particularly difficult for students—for example difficult concepts, thinking skills, ways of seeing, or readings. Be prepared to share your explanation with a colleague.

Difficult Concept

Operant conditioning seems to confuse my students. They are so used to attributing behavior to internal motivation that they have difficulty understanding the real implications of behaviorism. They memorize the definitions of stimulus, response, contingency, ratios and schedules of reinforcement and so forth. But they still end up thinking that their dogs wag their tails because they are happy little dogs overjoyed to see their masters. They don’t like to imagine determinism. Perhaps it frightens them. At any rate, they seem to memorize the terms without fully understanding the implications of a world without freedom. —psychology professor

Difficult Thinking Skill

My students reach closure too rapidly. I give them a case problem with lots of variables and they won’t systematically look at each variable. [Provides an example.] They don’t think through the strengths and weaknesses of alternative approaches or solutions. They don’t want to wrestle with a problem and seem satisfied with the first answer they come up with. —business professor

Difficult Way of Seeing

Students don’t see the “unnaturalness” of socially constructed codes such as dress codes. They think they are making free choices without seeing how they have been culturally constructed to dress in a certain way but to believe they are making free choices. I want to help them start to undo the codes. I want them to see how advertising works not only to create particular consumer desires but also to construct a subject that sees consumption as natural. . . . —communication professor

Difficult Readings

My course is full of primary historical documents. Students don’t know how to read these through the lens of an historian. They can’t shift from reading textbooks (learning the facts) to entering historical debates using primary sources . . . --history professor

Note: The notion of “difficult concept, thinking skill, or way of seeing or reading” is similar to what researchers at the “Decoding the Disciplines” project call “learning bottlenecks.” (See www.decodingthedisciplines.org). Another related term is “threshold concepts”—see bibliography on the decoding the disciplines website.

Example of a “Backward Designed” Assignment Sequence in Literature

Beginning of term → End of term

Major Research Project

Frequently assigned low-stakes “thinking pieces” along with in-class discussions and small group tasks	Skill-Building Research Assignment on <i>Paradise Lost</i>	Prospectus for Major Researched Literary Paper	Annotated Bibliography of Peer Reviewed Articles	Major Researched Literary Paper
<p><i>One of the most heated early debates on Hamlet—when critics focused on character—was why Hamlet delays. Try entering this debate. What is your theory on why Hamlet doesn’t swoop to his revenge as he promises?</i></p> <p><i>Play the believing and doubting game with this thesis: Hamlet is one of Shakespeare’s “evil” heroes, like Macbeth.</i></p> <p><i>What do you admire about Milton’s Satan? What do you think Milton admired?</i></p> <p><i>Play the believing and doubting game with the following thesis: Milton’s view of Eve is misogynistic.</i></p>	<p>To what extent is Milton’s view of Eve misogynistic? Within your paper incorporate the views of one scholarly source on this issue (Gilbert and Gubar). [See assignment next page. Students can revise this paper for a new grade.]</p>	<p>Submit a one-page (single-spaced) prospectus that describes the interpretive problem or question that you plan to address. Explain why you are personally interested in and invested in this question. Show how the problem or question is rooted in your chosen literary text. Show why the question is both (1) problematic and (2) significant</p>	<p>Produce an annotated bibliography of the peer reviewed scholarly articles or books you expect to cite in your major paper. The annotations for each entry should include a summary of the article’s argument, an evaluation of the argument’s strength, and an explanation of how you might use the source in your paper.</p>	<p>Write an 8-12--page literary argument addressing significant question related to any of the texts we have read this term.. The introduction to your paper should pose the question or problem that your paper will address and engage your reader's interest in it. Within your paper, you must join in conversation with other scholars who have addressed your interpretive problem. Your proposed answer to this question (summarized in a single sentence) will serve as the thesis statement for your paper. Imagine this paper will be delivered at an undergraduate research conference. Assume that your audience has NOT read this assignment and will attend your conference session because your title hooked their interest.</p>

→ Frequent “thinking pieces” throughout the course for generating ideas

→ Draft workshops, conferences, peer reviews

A Skill-Building (Scaffolding) Research Assignment (Literature)

Was Milton a Misogynist?

Situation: Renaissance misogynist writers typically tell the Adam and Eve story to justify patriarchy and warn men about women's seductive and deceitful nature. You wonder whether Milton in *Paradise Lost* has similarly misogynistic views of Eve. To extend your thinking, you have read "Milton's Bogey: Patriarchal Poetry and Women Readers" from Sandra Gilbert's and Susan Gubar's classic feminist study of 19th Century women novelists, *The Mad Woman in the Attic*.

Your Task: Write a 3-4 page paper (double-spaced) that provides your answer to the question "*Does Paradise Lost reproduce the misogynist view of Eve frequently encountered in Renaissance anti-feminist discourse?*" Besides providing your own well-supported argument addressing this question, your paper must be in conversation with Gilbert and Gubar's views about Milton's misogyny in *Paradise Lost*. (You can either disagree with Gilbert and Gubar, or you can incorporate and extend their views in some way.) Your paper should thus include the following three features: (1) An introduction that sets up the question you are going to address (assume that your audience has not read the assignment); (2) a summary of Gilbert and Gubar's arguments about the view of Eve in *Paradise Lost*; and (3) your own argument addressing the assigned question. Place your thesis statement at the end of your introduction.

Audience and Genre: This should be a short academic paper in MLA style addressed to peer English majors wrestling with the problem of Eve in *Paradise Lost*. Assume your audience has read *Paradise Lost* but not "Milton's bogey." Assume that your readers are either still confused about Eve or inclined to disagree with your view

Purpose of This Assignment: This assignment will help you develop the following skills needed for your major research project.

- The ability to make your own argument about a literary question and to bring your argument into conversation with another critic.
- The ability to summarize the other critic's views, to integrate those views purposefully into your own argument, and to distinguish the source's ideas from your own through attributive tags such as "according to Gilbert and Gubar" and "these authors claim further that . . ."
- The ability to cite the source in your text itself (using MLA's parenthetical style) and to give complete bibliographic information (using MLA conventions) in a separate "Works Cited" page.

Scoring Rubric for Paradise Lost Paper

Title and introduction

Criteria	10 9 8	7 6 5 4	3 2 1 0
<ul style="list-style-type: none"> Has complete academic title forecasting content Presents and develops the problem of the poem’s presentation of Eve Briefly summarizes a view being “pushed against” Ends with contestable thesis showing your position on the problem 	Meets all criteria at high level; clear	Meets some criteria; uneven; less clear	Meets few criteria; unclear

Overall quality of ideas, argument, effective evidence

Criteria	30 27 24	21 18 15 12	9 6 3 0
<ul style="list-style-type: none"> Has well supported argument that addresses question while anticipating and responding to alternative views Uses “textually dense” evidence (frequent references to specifics in PL including brief quotations, paraphrase, or summary of scenes) Has strong insights; shows clear wrestling with complexity 	Meets all criteria at high level; clear	Meets some criteria; uneven; less clear; thinner; less precise use of evidence	Meets few criteria; unclear

Integration of Gilbert and Gubar

Criteria	10 9 8	7 6 5 4	3 2 1 0
<ul style="list-style-type: none"> Accurately summarizes Gilbert and Gubar’s arguments about Eve and misogyny in PL Integrates summary smoothly into writer’s argument Uses summary intentionally either as an opposing view to push against or as support for the writer’s own position Uses attributive tags effectively to differentiate writer’s view from G&G’s 	Meets all criteria at high level; clear	Meets some criteria; uneven; less clear	Meets few criteria; unclear

Organization and Development

Criteria	10 9 8	7 6 5 4	3 2 1 0
<ul style="list-style-type: none"> Has clear, easy-to-follow structure (reader doesn’t get lost) Has sufficient development so that ideas are fully explored Follows old/new contract Has points connected to thesis and developed with textual particulars to form unified/coherent paragraphs Uses effective transitions between paragraphs 	Meets all criteria at high level; clear	Meets some criteria; uneven; less clear	Meets few criteria; unclear

Sentence Clarity and Grace

Criteria	10 9 8	7 6 5 4	3 2 1 0
<ul style="list-style-type: none"> Has clear, graceful, grammatically correct sentences Maintains focus through effective subordination and coordination Concise (non-wordy) easy-to-follow style 	Meets all criteria at high level; clear	Meets some criteria; uneven; less clear	Meets few criteria; unclear

MLA conventions

Criteria	10 9 8	7 6 5 4	3 2 1 0
<ul style="list-style-type: none"> Looks like a professional critical argument in literature Follows MLA conventions for citation and documentation Follows MLA formatting for Works Cited and page design 	Meets all criteria at high level	Meets some criteria; uneven; some deviation	Meets few criteria

Penalty for editing errors

+5 0 -2	-4 -6 -8	-10 -15 -20
Flawless paper (+5) or an occasional but minor error. Strong professional ethos.	Some distracting noise via spelling, punctuation, or apostrophe errors or occasional grammar mistakes (subject-verb agreement; fragments; non-parallel constructions). Writer seems careless.	Paper seriously marred by editing errors or grammatical mistakes; professional “ethos” of writer is destroyed by errors.

Example of a Backward Designed Assignment Sequence in Intermediate Microeconomics

Illustration of Well-Structured Versus Ill-Structured Microeconomic Problems

Algorithmic (well-structured) problem asking for right answer	Argumentative (ill-structured) problem asking for claim with reasons and evidence
<p>“Calculate the own- and cross-price elasticities of demand for turkey based on the following demand curve, $Q = 23 - 2P_T + 1.5P_C$. The price of turkey is $P_T = \\$2.50$ per pound, the price of chicken is $P_C = \\$2$ per pound and the quantity of turkey is 21 thousand tons per year.”</p>	<p>You are an economics intern for state Representative Jane Smith to provide economics expertise on legislative issues. Faced with budget deficits, Representative Smith is considering proposing an increased state gasoline tax as a new source of state revenue. She asks you to write a two-page recommendation memo for or against raising the gas tax based on your economic analysis of the potential revenue that could be raised through such a tax as well as on your evaluation of the pros and cons of the tax. Include at least one graph (not counted toward the two-page limit.) Representative Smith is not an economist and is EXTREMELY busy. All writing has to be clear, concise, accurate, and understandable to a lay audience..</p>
<p>Questions students seldom ask:</p> <ul style="list-style-type: none"> • Why use this particular demand curve? Where did this formula come from? • How did they get these price and volume numbers? • Who cares about the elasticity of demand for turkeys? 	<p>Questions this assignment forces students to ask:</p> <ul style="list-style-type: none"> • What algorithms/formulae/graphs from our course apply to this kind of problem? • How do I find the data/numbers to plug into the formulae, construct the graphs, and do the calculations? • What would be the positive and negative consequences of an increased gas tax?

Assignment Design and Sequencing for New Course

Throughout Course	Mid-course	After Memo #1	End course
Algorithmic homework problems from textbook	Policy Memo 1 (fully guided by instructor)	Library session	Policy Memo 2 (less guided)
<p>Microeconomics theory and tools requiring algebra and calculus scaffold all assignments</p> <p style="text-align: right;">⇒</p>	<p>Low stakes policy problems blend well-structured and ill-structured elements; combine calculations with free writing; spark class discussion; serve as scaffolding for policy memos</p> <p style="text-align: right;">⇒</p>	<p>High stakes graded assignment; instructor provides all research sources; annotated bibliography serves as scaffolding for library session</p> <p style="text-align: right;">⇒</p>	<p>Librarian teaches students how to find own sources in business/economics databases; serves as scaffolding for last assignment</p> <p style="text-align: right;">⇒</p>
			<p>High stakes graded assignment; students pose own problem and rhetorical context; use databases to find all their own sources</p>

Assignments used with permission from Dr. Gareth Green, Department of Economics, Seattle University

NOTE: The first stage of our research has been published for economic audiences:

Gareth P. Green, John C. Bean, and Dean J. Peterson (2013): Deep Learning in Intermediate Microeconomics: Using Scaffolding Assignments to Teach Theory and Promote Transfer, *The Journal of Economic Education*, 44:2, 142-157

Example of a “Bridging” Homework Problem Based on Economic News Story

[The assignment is based on a news article about parking in downtown Seattle. Specific data in this assignment is either hypothetical or based on the instructor’s own research knowledge].

City-provided public parking is often priced much lower than private parking lots and garages because the private lots pay close attention to what price consumer are willing to pay. Unfortunately, the low price of publicly provided parking encourages consumers to “hunt” for low priced parking, which leads to increased traffic congestion, accidents, and increased pollution. The City of Seattle is considering increasing parking meter fees to increase revenue and reduce the negative impacts of low priced parking. Currently, the estimated quantity and price is 105% of capacity at \$2.00 per hour. Several studies have indicated that the optimal level of demand is 85% of capacity. Further, a recent study showed that the own-price elasticity of demand for parking is -0.2. Seattle currently has 8,586 metered parking spaces.

- a. What are the current equilibrium quantity, price and revenue from city metered parking in Seattle?
- b. Discuss the likely "shape" of the public supply curve and what that indicates about the impact of an increase in parking meter fees for the city and consumers.
- c. Explain and draw a graph indicating how increasing parking meter fees would impact the market for public parking. What is the new parking meter fee that will lead to the desired quantity of parking?
- d. What is the new revenue for the city from the new parking meter fee?
- e. Discuss who bears the burden of the parking meter fee increase?
- f. List and discuss the additional benefits and costs of this policy that are not included in the previous calculations.
- g. Do you think the City of Seattle should proceed with the policy to increase parking meter fees? Why or why not?

Students answer these questions outside of class in preparation for in-class discussion: Questions are a mixture of algorithmic calculations, drawing of graphs, and freewrites to stimulate discussion. Instructor collects their homework but only spot checks it.

EIGHT IDEAS FOR CREATING PROBLEM-BASED TASKS FOR YOUR COURSE

1. Ask students to explain a course concept to a new learner (requires students to understand the concept at a level deeper than memory)

- Using your own illustrative examples, explain to a classmate who missed last week's lectures why a learned behavior is less resistant to extinction if it is reinforced regularly rather than only occasionally.
- Explain to a grade school child who has just been diagnosed with Type 1 diabetes what is meant by the glycemic index of foods and show why this concept matters
- Draw two α -helices within a protein interacting with each other and explain the role that intermolecular forces play in this interaction

2. Think of a controversial thesis in your field; ask students to support or attack the thesis or play the believing/doubting game with it (teaches disciplinary use of evidence).

- GMO crops are necessary for both preserving the environment and feeding the world.
- Prescribing Ritalin and other psychotropic medications is an appropriate treatment for behavioral problems of children.

3. Think of disciplinary questions, problems, or puzzles that require claims with supporting arguments (old essay exam questions are often excellent here).

- *Othello* begins in the conventional, rational world of Venice. Within this world fathers want their daughters to marry the "wealthy, curled darlings" of their own nation—to preserve Venice from the threat of "outsiders." Desdemona chooses to marry an "outsider" in both race and class. To what extent does Shakespeare's *Othello* perpetuate Elizabethan stereotypes of the ethnic outsider versus critiquing and undermining those views?
- Now that we have discussed various design approaches for the circumference-mounted radiator fan, what do you recommend as the most optimal solution for the truck manufacturer? Write an email message to the other members of your design team arguing for the approach you think your team should take.

4. Give students a data set to analyze (teaches students to use quantitative data to make arguments)

- To what extent do the attached economic data support the hypothesis "Social service spending is inversely related to economic growth"? First create a scattergram as a visual test of the hypothesis. Then create a verbal argument analyzing whether the data support the hypothesis. (Courtesy of Dr. Bridget Hiedemann, Economics, Seattle U)
- Your friend and you are looking over the attached table that shows the most recent mean and median income of U.S. households by age categories. You notice that for retired households, the mean income is substantially higher than the median income. Your friend, looking at the mean income, says that retired people in the US are surprisingly well off. You want to argue that the median income tells a quite different story, but then your friend has to rush off for a meeting. Send your friend an email message about one screen in length that explains the difference between "mean income" and "median income" and that argues that the income status of retired people is not so rosy if we focus on median rather than mean income.

5. Give students a challenging reading to summarize; then ask them to write "strong responses" to the reading through analysis, reflection, or dialogic argument

- Write a 200-250 word summary of Kenneth Galbraith's paper, "The Theory of Countervailing Power." Your summary should accurately convey the content of the paper while being

comprehensive and balanced. Then explore to what extent Galbraith's theory can be applied to our recent class discussion of low wages in the fast food industry.

- Summarize the Federal Trade Commission's argument against the advertising claims of the pomegranate juice company Pom Wonderful. Then, assuming that you are spokesperson for Pom Wonderful, write a one-page reply that attempts to rebut the government's argument. At issue is whether PomWonderful pomegranate juice be considered a food, a nutritional supplement, or a drug.
6. Give students a peer-reviewed article to wrestle with (teaches students disciplinary ways of entering into conversation with other scholars)
- Read the assigned paper by Baron-Cohen et al. on fetal exposure to testosterone. To what extent do you think this paper supports or undermines the nature theory of gender identity?
 - In the introduction to a conference paper, you want to show that critics disagree on how to regard Caliban in *The Tempest*. Using the two scholarly articles on Caliban that I have posted on our course site, write the section of your introduction that will show how these two scholars disagree on their reading of Caliban. Limit yourself to 350 words.
7. Let students develop their own questions (teaches question-posing strategies in your discipline)
- Now that we have practiced asking interpretive questions about poems, consider Yeats' "Among School Children." Propose your own interpretive question about this poem, and then write an explication of the poem that tries to answer your question.
 - Pose an empirical research question of the form "What is the effect of X on Y?" and then explore the way that you might design an experiment to try to answer this question.
8. Ask generic write-to-learn questions (promotes reflection and metacognition)
- What confused you in today's class or today's readings?
 - How does your personal experience relate to what you studied today?
 - What effect is this course having on your personal life, your beliefs, your values, your previous understanding of things?
 - How does what we have been studying recently relate to your other courses or to other parts of this course?

Workshop Task: Earlier you identified some aspects of your course that were difficult for students—a difficult concept, thinking skill, way of seeing, or reading. Keeping these difficult aspects of your course in mind, peruse this list of suggested ways to create problem-based tasks. (You could use any of these tasks for short or long formal paper assignments, for informal exploratory writing, or for small group problem-solving.) Think of possible ideas for tasks that might help students learn a difficult course concept, develop a valued critical thinking skill, learn certain disciplinary ways of seeing, or wrestle with a difficult reading.

On your own: Spend five minutes thinking of ideas and jotting down notes

With colleagues: Share ideas

DESIGNING AN EFFECTIVE ASSIGNMENT

1. Decide what kind of writing you want students to do and how much freedom you want students to have. (Note that minimizing your work load may requires some tradeoffs)
 - Short assignments are easier to grade than long ones
 - Giving all students the same problem-based assignment yields easier-to-grade papers than giving students free choice of topics and approaches. Giving all students the same assignment also allows for easier scaffolding via thinking pieces and in-class discussions and debates.

2. Create an assignment handout that includes the following elements:
 - **Problem-based task:** Set up the question, problem, or issue that you want the student to address. You can specify the problem, give students a choice of problems, or ask students to pose their own problems. NOTE: If you give students a “topic” rather than a problem, you are apt to get an “all about paper” rather than a thesis-governed analysis or argument addressing a problem.
 - **Stipulated rhetorical context (real or hypothetical):** Writers need to write for a purpose to an audience within a genre
 - **Audience:** The targeted readers who will be potentially interested in the writer’s problem and argument
 - **Writer’s role or purpose:** The writer’s purpose can often be described in terms of the effect the writing should have on the audience—what the writer wants the audience to know, believe, or do as a result of reading the paper
 - **Genre:** Students need to learn the conventions of specific genres such as experimental report, memo, proposal, academic argument or analysis. Also specify your requirements for format, length, documentation style, and so forth.
 - **Evaluation criteria:** Create a rubric to show your grading criteria. Include the rubric in the assignment handout.
 - **Process:** For longer assignments, explain the process you expect: due dates for drafts, peer reviews, visits to Writing Center, and so forth
 - **Explanation of the purpose of the assignment (your goals):** Explain what you want students to learn by doing the assignment. (If you don’t have a specific statement about purpose on your handout, you can explain the purpose orally when giving out the assignment.)

Note on Audience: When specifying an audience in an assignment, the instructor also needs to help students visualize the audience’s initial stance toward the writer’s subject. The instructor’s goal is to move students toward a thesis with tension—what Graff and Birkenstein* call the “They say/I say” move: “Many people think X, but I am going to argue Y” or “Before reading my paper my reader will think X. After reading my paper, my reader will think Y.” The writer’s goal is to change in some way the reader’s initial stance or view.

- Your classmate is confused about X (or disagrees with you about X). Send him or her an email that . . .
- Your readers doubt that these data support the hypothesis. In your “Discussion” section, make your case but with appropriate hedges
- Scholars are divided about X. Write a formal academic paper presenting your position on this disciplinary problem. Imagine presenting the paper at an undergraduate research conference where listeners are apt to be skeptical of your thesis.
- You are a research assistant to Senator Smith who needs to decide X. Write a policy brief that . .

*Gerald Graff and Cathy Birkenstein. 2006. *“They Say/I Say”*: *The Moves that Matter in Academic Writing*. New York: Norton.