

# A Tale of Two Prompts: New Perspectives on Writing-to-Learn Assignments

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Many claims have been made in the past four decades about the efficacy of writing as a means of fostering student learning in a variety of disciplines. Yet, reviews and meta-analyses of publications about the implementation of writing-to-learn (WTL) pedagogies show mixed results. Ackerson's review of thirty-five studies, for example, found little empirical evidence for conceptual learning as a result of WTL. Similarly, Rivard concluded that "A number of issues must be addressed before the research base that supports writing to learn becomes widely accepted by science educators" (975). Investigating the relationship of writing assignments to effects on learning, Durst and Newell found that taking notes and answering comprehension questions may enhance retention, but that more analytical writing engendered "complex understandings" or conceptual understandings (386). Similarly, Bangert-Drowns et al. (2004) observe that "the simple incorporation of writing in regular classroom instruction does not automatically yield large dividends in learning" (51). Finally, Ochsner and Fowler call for more precision in defining key terms and for empirical evidence of WTLs "actual (rather than presumed) effects on students' education" (134).

To address the limited evidence that WTL pedagogies actually engender students' conceptual learning, Rivard recommended analysis of writing tasks or assignments to determine which ones promote knowledge transformation. Bangert-Drowns et al. (2004) responded by coding writing tasks according to five variables: informational, personal, imaginative, metacognitive reflection, and feedback, and they found that metacognitive reflection showed a statistically significant relationship to more positive effects of writing to learn. Feedback proved too complicated to code accurately, and the other three variables showed no effect. Arnold et al. (2017) analyzed genres of writing assignments and found that essays engendered elaboration and organization that supported conceptual learning while note-taking and highlighting did not. With these exceptions, there has been little response to Rivard's call for more analysis of WTL *assignments*.

Since the publication of Bangert-Drowns et al., however, assignments have received increased attention within writing studies. Melzer's 2014 analysis of 2,101 assignments from one hundred universities revealed how many assignments are underconceptualized, providing students with no indication of audience or purpose and relying on terms like *essay* and *research paper* with little attention to the

ways genres are enacted in different disciplines. Anderson et al. showed statistical correlations between enhanced student learning and writing prompts that included three features: interactive writing processes, clear expectations, and meaning-making activities. A systematic review of published studies about WTL by Gere et al. (2019) provided empirical evidence that assignments that include the three features identified by Anderson et al., combined with the metacognitive elements recommended by Bangert-Drowns et al., yield verifiable conceptual learning.

While this body of work provides valuable tools for measuring the quality of WTL assignments, it does not address how students understand and take up such assignments. In response to this research gap, our association with M-Write, a university-wide program focused on integrating WTL pedagogies into large enrollment gateway courses, provided us with both the exigency and opportunity to explore how students take up WTL assignments. The goal of the M-Write project is to foster deeper conceptual learning in large-enrollment foundational or gateway courses with writing-to-learn pedagogies. The several thousand M-Write students who have participated in this program each semester write responses to carefully crafted prompts that create a rhetorical context, specify a genre, and require the application of knowledge to real-world situations. Through these assignments, they engage with Anderson et al.'s categories of clear expectations and meaning-making activities. Additionally, using an automated system, they participate in peer review and are guided by upper-division students called Writing Fellows; through these activities, they engage with the Anderson et al. category of interactive writing processes. Finally, drawing on their experiences in peer review, they write a revision, thus addressing Bangert-Drowns et al.'s category of reflective metacognition.

Building on Herrington's (1985) finding that assignments need to be integrated into the context of a given course, we created assignments that called upon key concepts of the given discipline. Given that the writing assignments asked students to call upon memory of concepts they had learned recently and translate both genre and conceptual knowledge into a new context, the concept of *uptake* proved useful in our analysis. As articulated by Freedman (2002), uptake builds on Austin's (1962) speech act theory by specifying the processes that intervene as a statement is taken up as action. In particular, she emphasizes the process of selection as students choose from among multiple memories that they then translate into a new context. Rounsaville (2012), expanding upon Freedman, explains that the concept of uptake gives language to the ways students call upon and translate the recent memories of subject matter learned and the more distant memories of previous learning and experiences to draw upon. This process of translation reformulates learning for new contexts. For our students this meant translating both subject matter and genre knowledge into written responses called for by a given assignment. Building on large-scale analysis of

assignments across the disciplines (e.g., Melzer) and student learning across writing experiences (e.g., Anderson et al.), we determined that looking at writing students produced in response to M-Write assignments through the lens of uptake could provide valuable information about the learning effects of WTL pedagogies.

Working with a faculty member in statistics, we developed and implemented two prompts that adhered to the principles outlined by Bangert-Drowns et al. and Anderson et al. and called upon key concepts in the field of statistics: the Caffeine Studies prompt, where students were prompted to relate statistical information from two studies about caffeine to their grandparents, and the Chocolate and Cycling Prompt, where students were asked to take on the role of consultants drawing on statistical research as a means of advising the Tour de France team on cyclists' diets. Both prompts are showcased below as figures 1 and 2.

*Objective:* Popular media sometimes inaccurately present the results of research studies and, as a result, make inappropriate claims and draw unreliable conclusions. When popular media writers combine multiple studies and do not have a sound understanding of the statistics, this can be accentuated. These issues, paired with a lack of understanding regarding study development and statistical analysis of the results, can lead to false perceptions of the scientific findings. Your grandparents are sometimes confused by all the contradictory scientific claims they see in the news. Recently, they read an article in *The Washington Post* that claimed to offer some scientifically substantiated advice about caffeine consumption. After having read the article, your grandmother is convinced both she and your grandfather are consuming too much caffeine. Your grandfather disagrees with her. They've asked you to help them interpret the article. Using both *The Washington Post* article and the *Food and Chemical Toxicology* study it references, write your grandparents an email that explains to them what kinds of questions they need to ask before they can determine whether they are consuming "too much" caffeine, and how to figure out what kind of consumption habits the sample study is talking about. To do this, summarize the study's research question(s), including a basic description of the study design, what the study was measuring, and the statistical method(s) they used. Include references to the explanatory variable, response variable and any confounding variables; you may need to explain what these mean. Include in your email an argument about whether or not your grandparents should trust the claims made by *The Washington Post* and how they should interpret the results.

*Items to keep in mind:*

- When we read your drafted email, we will play the role of your grandparents with minimal statistical literacy who are trying to understand the complexity of the statistics underlying scientific claims.
- Cite your external references (both the news article and study as well as any additional references) using MLA format.
- Since you are explaining this to your grandparents, you should take care to carefully edit and proofread your email.
- This should be an email of between 350–500 words.

**References:**

- Mitchell, D. C.; Knight, C. A.; Hockenberry, J.; Teplansky, R.; Hartman T. J. Beverage caffeine intakes in the U.S. *Food and Chemical Toxicology*. 2014.63.
- Berman, J. “What’s real and what’s myth when it comes to caffeine?” *The Washington Post* 11 July 2016.

Figure 1. Caffeine Studies Prompt

In crafting this assignment, we called upon the three features that Anderson et al. identified as correlating with enhanced student learning. In their definition, *interactive writing processes* involve student writers communicating orally or in writing with one or more persons at some point between receiving an assignment and submitting the final draft. This interaction might include getting feedback from a peer, a friend, or an instructor, and it might be carried out in required peer review sessions, conferences with instructors, or a session at a campus writing center. For M-Write, interactive writing processes took the form of automated peer review, interaction with upper-class Writing Fellows, and occasional consultation with professors.

Anderson et al. describe *meaning-making writing tasks* as those that require students to engage in some form of integrative, critical, or original thinking. This dimension includes asking students to apply a course concept to a real-life situation, provide concept-based evidence to support an argument, or to evaluate a claim using a course concept. Each M-Write assignment, like the one above, asked students to apply course learning to a new context. Specifically, this assignment required the meaning-making activity of explaining the study, design, and use of discourses of statistics with terms like *confounding variable*. Anderson et al.’s description of *interactive writing processes* is evinced by the procedural elements embedded in the curriculum: after students drafted responses to this assignment they used the automated peer review tool to

respond to one another's drafts. Finally, for Anderson et al., *clear writing expectations* focus on making sure that students understand what they are supposed to do and providing them with the criteria by which their writing will be evaluated, as the level of detail offered by the above-quoted prompt suggests. In addition, the assignment calls for the genre of an email addressed to the grandparents' question. This, along with "items to keep in mind" as well as the specification of which aspects of statistics should be included, was designed to make the expectations of the assignment clear. To assure that students could provide one another effective peer review, as well as to reinforce clarity of expectations, we gave students the following rubric:

1. This email should be written using language that your grandparents can understand. What parts were clearly written? What parts were hard to understand?
2. Evaluate the summary of the research question(s). The email should include a description of the study design, including if the study is experimental or observational, the sample size, and population of the study. What is explained well? How can the description be improved?
3. There should be a description of the method of statistical analysis the study used and
4. an analysis of the statistical significance of the results. What was missing or hard to understand?
5. The roles of the explanatory variable, response variable, and any confounding variables should be described. Which variables are described well? Which variables are missing or unclear?
6. Comment on whether the writing makes a coherent argument about caffeine consumption. What is missing from the discussion of if the claims made by the media are supported by the statistical results of the study?

Here, we provided further detail on what students needed to include regarding features of the study, statistical significance, and variables of the study, thus adhering to the *clear writing expectations* principle outlined by Anderson et al. After they completed peer review, students were required to write a revision of their original drafts, a process that added an element of metacognition to their writing experience (Johns; Ferris & Hedgcock); this curricular feature reinforces the metacognitive element recommended by Bangert-Drowns et al.

Another prompt used in the statistics class followed a similar pattern; for more detail, see figure 2.

*Objective:* You have been hired by the U.S. bicycle team to help them train for the Tour de France. The head trainer recently read an article, which claims that consumption of dark chocolate results in increased oxygen consumption during cycling. The experimental setup consisted of a randomized crossover design where the oxygen consumption of  $n = 9$  male participants was measured in two trials after participants consumed either dark chocolate or white chocolate. A crossover design is a repeated measurements design such that each subject receives the two different treatments (dark chocolate versus white chocolate) during the different time periods, i.e., the patients **cross over** from one treatment to another during the course of the experiment. The order of which treatment was received in the first time period was randomized. Prior to receiving the first treatment, each participant underwent baseline measurements. Data was gathered and analyzed as depicted in the table below.

Maximal Oxygen Consumption\* (Note:  $n = 9$  for each condition)

	Baseline	White Chocolate	Dark Chocolate
Mean (ml/kg min)	41.89	41.84	44.52‡
Std dev	5.4	5.6	6.43
p-value†	-	0.071	0.037

†p-value is for statistical comparison with respect to baseline

‡Dark Chocolate: 95% Confidence Interval for the population average change in maximum oxygen consumption (over baseline) is 0.21 ml/kg min to 5.05 ml/kg min.

The trainer knows you have some statistics background and wants your opinion about whether or not dark chocolate should be added to the athletes' diets. Based on the results from the article, write a memo to the trainer explaining what the statistics show and make an argument for or against inclusion of dark chocolate in the athletes' diet. Your memo should include a little discussion about how a crossover design affects the data analysis. Describe what the p-values indicate about the results, and the meaning of statistical significance. Finally, comment about the provided confidence interval, including both an interpretation of the confidence interval itself and the meaning of the confidence level.

*Items to keep in mind:*

- When we read your memo, we will play the role of the trainer with minimal statistical literacy who is trying to understand the significance of these results.
- If you have any references, be sure to cite them using MLA format.
- Since you are explaining this to the head trainer, you should take care to carefully edit and proofread your memo.
- This should be a memo of between 350-500 words of core content (i.e. not including header or references). See the Purdue OWL website for information about how to draft a memo: <https://owl.english.purdue.edu/owl/resource/590/1/>
- You should not include your name on this initial draft (to keep the peer review anonymous).
- Data from: Patel, R. K.; Brouner, J.; Spendiff, O. Dark chocolate supplementation reduces the oxygen cost of moderate intensity cycling. *Journal of the International Society of Sports Nutrition*. 2015 12:47.

Figure 2. *Chocolate and Cycling Prompt*

Here, as in the previous assignment, we grounded the assignment in real-world data, specified the features students needed to include, and added details designed to help them produce the best possible memo. Students followed the same process of peer review, using this rubric:

1. This memo should be written to be understandable to someone with minimal statistical literacy. Comment on whether this was achieved. What parts were hard to understand?
2. The relationship between crossover design and data analysis should be discussed. What did the discussion do well? What additional information should be included?
3. Comment on the discussion of statistical significance. What is explained clearly? Which elements are missing?
4. There should be a description of  $p$ -values and what they indicate about the results. What is described well? How can the description be made clearer?
5. Comment on the explanation of the difference between a confidence interval and confidence level. Are there any aspects that are missing? What is made clear?

We launched these two prompts with the hope that our pedagogical goals of enhancing students' comprehension of statistical concepts like experiment design, variables,  $p$ -value, crossover design, standard deviation, and so on would be achieved as they composed their written responses. To evaluate whether students were demonstrating their understanding of statistical concepts, we analyzed their writing to determine the amount and type of learning evident there. We assessed students' uptake of these two prompts in an attempt to understand the extent to which prompts that followed the guidelines proposed by Bangert-Drowns et al. and Anderson et al. fostered the desired level of conceptual learning. Each assignment required students to call upon their memory of statistical terms and concepts and to translate them into the new contexts of writing an explanation to grandparents and a trainer. Despite their similarities, these prompts differed in terms of genre—email versus memo—and in the quality of translation required. The first asked students to both summarize and evaluate key features of a study, while the second focused on the more limited space of crossover design and  $p$ -values. These differences led us to expect that student uptake of these two assignments might differ.

## Methods

Students enrolled in the Introductory Statistics course had the option of selecting an “honors” credit for the course for completing writing assignments in addition to the regular coursework. Students who opted to participate in these additional writing assignments consented to the analysis of their writing for the purposes of this research. Of just over 200 students, 150 chose to participate, though not all finished the course or completed every prompt. Students were given three writing prompts, including the two described above. They wrote drafts and submitted them for electronic peer review, with drafts circulated anonymously to other participants, who used the provided rubric as a basis for feedback. Participants also had the option of meeting one-on-one or in small groups with undergraduate writing fellows who were hired to attend lectures and hold office hours to give feedback on writing and help with the drafting process. These fellows were students who had previously taken the courses and were identified by the instructor as highly-successful students. To prepare for supporting WTL assignments, they enrolled in a course focused on processes of writing. After drafting, peer review, meeting with fellows, and revising, students submitted final drafts of their writing. They were graded on a credit/no-credit basis, based on their general display of statistical information and engagement in all stages of the writing process.

Once we collected participants' responses to these two prompts, we began the scoring process to determine how well students were incorporating statistical knowledge into their writing. This scoring was kept separate from the scoring associated



with students' grades. Using the rubric provided to students, we met in norming sessions with the entire group of evaluators, which consisted of all researchers and doctoral student members of our research team, alongside undergraduate writing fellows. We established a five-point scale with ones indicating no significant statistical knowledge and fives indicating a high level, sometimes incorporating statistical concepts that were not part of the current unit of study. Next, we divided into pairs to read and score each of the 201 pieces of writing, 97 that addressed the prompt focused on caffeine and 104 that responded to the prompt focused on chocolate. In cases where both members of the pair did not agree on a score, we called for a third reader to ensure reliable scoring across readers.

To understand the ways students take up the genres invoked by these prompts, we identified cases for closer analysis of student writing. Since the average scores for the email to grandparents and memo as a consultant were, respectively, 2.49 and 3.56, we began our analysis by looking at work from students who fell near that range. However, because 43% of the students scored a 4 on the memo from a consultant assignment, we were interested in expanding our range to include those students. If students had generally earned scores in the 2 range for one assignment, then moved to a range at or near a 4, what were they doing differently across the assignments? Therefore, we identified students with differentiated scores, meaning that they scored within the 2 range on the email to grandparents and then subsequently scored a 3 or 4 on the memo to consultants. In doing so, we started with the sampling strategy identified by Patton as "typical case sampling," which involves "select[ing] cases that represent an average trend in a data set" (268). Pragmatically, this sampling range provided us with a greater number of students to contact for consent to analyze and write about their responses, but this choice was also important in that it identified cases that were typical of the larger data set and eliminated students who were either getting significant amounts of statistical information wrong (which generally moved them to the 1s category) or who were going beyond the expectations of the prompt by including discussion of additional statistical concepts (which generally moved them into the 5s category).

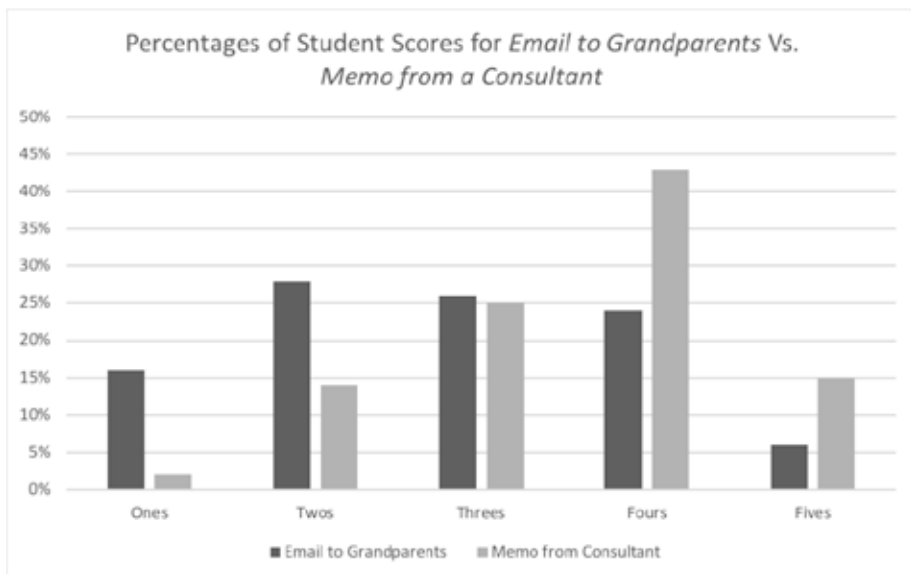
Of the student writing identified in this way, we further narrowed our sample by employing purposeful random sampling (Patton); six student writers were selected randomly from the list of names for closer analysis. We read each piece to identify how students had succeeded or failed to incorporate statistical information and what their writing illustrated about student uptake and the exigencies of the assigned genre. Of these six students, five wrote emails to grandparents and memos as consultants that were consistent with the trends described below. One student, we discovered, had scored low on the email to grandparents because of what seemed to be a misunderstanding of the prompt, which led the student to write an email advising his

grandparents how to set up a test to see if they fell in the safe range of caffeine consumption but neglected to include other statistical concepts targeted by the prompt. The remaining five students were contacted via email for consent to use their writing in case studies; three responded affirmatively, and we present a discussion of two below as typical of our findings.

To further understand student uptake in terms of both subject matter and genre knowledge, we contacted participants for follow-up interviews. Two students responded and we conducted face-to-face interviews, grounded in discussion of both prompts and responses the participants had written. We asked students to reread each prompt, then asked them to describe what the prompt seemed to be asking them to do, what difficulties (if any) they had faced when writing, and what effects the audience and genre had on choices the student made. These interviews were transcribed and coded thematically. Taken together, the larger collection of scores, analysis of student writing samples, and student interviews provided us with a more rounded perspective of student uptake.

## Results

When the initial scoring of student writing was completed, we immediately noticed a marked difference between the scores of the email to grandparents and the memo from the consultant, as figure 3 demonstrates. In the former, students were less successful in incorporating their statistical knowledge effectively. In contrast, in the latter, they were able to display statistical knowledge in clear and useful ways that were relevant to the task at hand. Certainly this is at least partially related to the sequencing of the assignments and the general progression expected in any course, as students develop better understandings of content and assignment structure over time. However, the extreme difference in scores suggests that there might be other factors underlying such difference.



*Figure 3: Students' scores for the two respective assignments*

One way to understand this trend was to investigate how students' writing illustrated levels of uptake relevant to the discourses of statistics and to the genres demanded by each prompt. In this investigation we found Kimberly Emmons' distinction between generic and discursive uptake helpful. Emmons defines generic uptake as "the selection and translation of typified forms and social roles" and discursive uptake as the translation of "key phrases rather than patterns of social organization" (192). Genre's social organization, in Emmons' terms, includes identities, ways of knowing, goals, and emotion, all of which shape students' uptake of every genre. During the scoring of writing produced in response to the two prompts considered here, the importance of genre and its accompanying social organization was immediately apparent. Most consultant memos were immediately recognizable as approximations of the genre, with headers, mock consultant firm names, and visual layouts drawing on templates for memos that the students found (several students used the same template, in fact). Similarly, all students formatted the email to grandparents with features common to an email or letter, opening with a salutation and closing by using "love" or "your favorite grandson" or similar genre-appropriate choices. But beyond these visible genre conventions, students' choices of language and framing reflect deeper differences in the ways these two assignments prompted students to deploy their statistical knowledge.

In the more personal genre of the email to grandparents, students framed their research questions to provide personal advice instead of directly displaying statistical knowledge. A good example of this tendency can be seen in Miranda's email where she focused on more general statements from the article (in bold), not the actual statistical discussion. Even when variables discussed in the article are referenced, she does so without discussing them explicitly as variables, as the underlined portions show. Instead, Miranda chose to write about alternate explanations in a personalized way that makes the relationship to the statistical concepts hard to determine.

**According to the scientific article, too much caffeine intake results in anxiety, headaches, and nausea.** So it would be a good idea to start looking to see if you are experiencing any of these symptoms, or all of them, in which case you might assume that you may need to cut down on caffeine. You can also monitor your sleep patterns—if you are having trouble falling asleep even though you drank coffee hours ago, timing may not be the problem. *The problem may be how much coffee you drank as opposed to when you drank it.* So if you are experiencing any sleep problems then maybe you can say that you've had too much caffeine and cut down on it and monitor your sleep patterns again. *Although, of course you can't conclude that caffeine is the only problem—there may be other underlying health problems.*

Miranda has made fairly rhetorically savvy choices for this genre and its intended audience. The underlined portions of the email draw her grandparents' attention to the importance of considering a range of variables, without getting bogged down in the technicalities of talking about variables as such. Unfortunately, this choice makes it difficult to assess the depth of her knowledge of these statistical concepts. Genre-based exigencies that determine what an email to grandparents might address to best suit the needs of its audience created a conflict with the assignment-based exigency to display discourses of statistics. Miranda's translation process emphasized the generic uptake at the expense of the discursive uptake of key terms from statistics.

However, in the same student's memo as a consultant to a Tour de France team, she frames her questions in ways that foreground the study methodology much more directly, maintaining a register that is more technical and specialized. Miranda identifies an important consideration—that this was a crossover study—and notes that this could have an effect on the results. She used *treatment condition* rather than a more commonplace phrasing like *the first chocolate they ate might affect how they respond to the second chocolate*. This choice is important in that it allows the student to use the terminology of a statistician, but it also creates a more distant and generalizable scientific register. When writing that crossover studies create the possibility for effects from one treatment condition to influence the second treatment condition, Miranda

is able to explain not only the factors underlying this particular case, but to display an understanding of how research methods can be interpreted in general.

After examining the results of the crossover study, I suggest that dark chocolate should be included in athletes' diets. **However, there are some things to keep in mind. Because this was a crossover study, there could be some effects from the first treatment condition on the second condition.** This means that if an athlete took dark chocolate first and it did in fact have an effect, some of this effect could still remain as the athlete takes the second treatment condition (white chocolate).

This student, whose earlier writing did not succeed in displaying the required statistical knowledge effectively, is able to introduce audience-specific questions and then explain how to answer them, discussing both the study results and the statistical implications of these results that might be of interest to her audience. Most notably, Miranda is able to explain in ways that highlight, rather than downplay, statistical concepts:

In addition, our 95% confidence interval for the difference in baseline oxygen consumption and the dark chocolate oxygen consumption is (0.21ml/kg min, 5.05 ml/kg min). *What this means is* that we are 95% confident that the true population mean increase in oxygen consumption lies somewhere between 0.21-5.05 ml/kg min when athletes consume dark chocolate. *This interval also means that* if we were to repeat this study multiple times, we would expect 95% of our confidence intervals to contain the true population mean difference in oxygen consumption when athletes consume dark chocolate.

The use of *this means* does not signal a translation to simpler non-statistical concepts, but highlights the ways that statistical analysis can predict future results with, in this case, high levels of confidence.

However, it is not only the case that certain genres might suggest to students that certain information be included or omitted. Instead, it seems as if particular genres actively constrain or encourage students' abilities to incorporate statistical knowledge. As we discuss further below, this constraining tendency aligns with Rebecca Nowacek's suggestion that prior genre knowledge can lead students down paths that produce writing that does not fulfill the requirements of the assignment at hand (41). Indeed, our analysis suggests that prompts that ask students to imagine themselves in ostensibly authentic writing situations but also display knowledge for an instructor might simply be asking students to do two things that seem incompatible or creating a mixed message like the course described in Herrington's (1985) study.

In those cases it is perhaps unsurprising to find students breaking with genre conventions to fit the requirements of the classroom assignment. For example, Jada breaks with the expectations of an email to grandparents a bit, including significant information like the recommended daily dose and the average amount of caffeine in a coffee (in bold), but then goes directly back to the more audience-friendly and genre-appropriate personal tone (underlined), a shift that is signaled immediately by a direct address, an explicit marker of personal opinion, and an exclamation.

Furthermore, **it would take a lot of coffee to exceed the FDA's daily-recommended dose of 400 mg/day**, which is stated in one of this article's references, which is a statistical overview of caffeine consumption by age group in the *Food and Chemical Toxicity Journal*. **According to this publication, the average cup of coffee has 95.2 mg of coffee in 8 fl. oz.** *You would have to drink four cups of coffee to reach the recommended dose. Personally, my morning cup is enough to get me going! Just thinking about drinking four cups of coffee is enough to make my hands shake.*

Jada seems conscious of the need to incorporate references to the assigned text, including academic-style source introduction and integration, as well as specific numbers, all of which leads to a straining of the email to grandparents genre. The need to name an academic journal, for instance, seems superfluous, unless the real reader is an academic who requires sources to be cited. This mixed generic uptake renders the text somewhat ineffective as either an email or as a display of statistical knowledge.

Like Miranda's though, Jada's memo from a consultant provides explanation that successfully displays high levels of course-appropriate statistical knowledge while maintaining genre and audience expectations. Responding to a request to analyze the reliability of the findings in a piece of published research, Jada is able to provide two levels of explanation. In the bolded examples, she provides her reader access to language, defining *null hypothesis* and a *p-value* of less than 5%. It is notable that even these translations of statistical terms into more everyday phrasings maintain a more technical register, compared to her language in the email to grandparents. Even more notable though is Jada's ability to go beyond explanation of meaning, moving toward explanation of implication, as the underlined section shows.

Thus by the p-test, with 95% confidence, the null hypothesis (**that there is no difference between the baseline metabolic measurements and the post-dark chocolate diet metabolic measurements**) can be rejected, because the p-value was less than 5%. **In other words**, there was less than a five percent chance of this event occurring. *This means that it is reasonable to assume that*

*the population-mean oxygen consumption is greater for the test subjects after consuming the dark chocolate.*

While the email to grandparents genre required this student to force statistical information somewhat awkwardly into the text, the genre of the memo from a consultant left space for Jada to use terms and concepts from class, explain them in complex ways that displayed her authority, and move toward the discussions of more complex implications that can be drawn from those more basic explanations. Her writing demonstrates a translation process appropriately balanced between generic and discursive uptake.

This detailed analysis of student writing showed the importance of genre and audience in students' uptake of these two prompts. For more direct information about students' uptake we conducted interviews with two statistics students: Amy, who achieved high scores on both prompts, and Eric, whose two responses were less successful. Amy scored a 4 on the memo to a consultant and was one of only a handful of students to score a 5 on the email to grandparents. In talking through her approach to the caffeine prompt, Amy said: "I think I probably had to read the study that was cited a few times, maybe read it once through to get a sense of it and then again to pick apart the different statistics that were mentioned. Then I guess I put myself in the shoes of someone who hadn't been learning stats at all just to make sure 'cause I know one of the main things was really to use language that would be understandable for anyone." She began the process by thoroughly reading and re-reading the study in order to get a sense of the statistical knowledge underlying the article. It was only once she had a firm grasp of the required conceptual knowledge that she then put herself "in the shoes of someone who hadn't been learning stats at all," that she began crafting language that would adequately bridge the gap between her audience's understanding and the understanding that the article required.

In contrast, Eric, who received a score of 2 on the email to grandparents assignments, described an approach that seemed to start with the audience and work backward to the assignment: "I think I took an informal enough approach to it so it could seem like I was writing it to my grandparents. I think I did a decent job of explaining the statistical part of the *Washington Post* article so that somebody who didn't understand statistics could understand it." And yet, Eric realized that there were issues with his writing in terms of communicating conceptual knowledge. He reflected that he "might have been able to do a better job explaining the process of how to draw the conclusions instead of just saying what the numbers are, explaining what they mean and explaining what the conclusions are." Concerns with the social organization of the genre seemed to be a key hang-up for Eric in determining how to respond to this prompt. He noted that, "I think I was definitely conscious of it, trying to—trying to make it as informal as possible . . . I honestly don't know how I could improve on that.

That’s probably the toughest part of this prompt.” Focusing on generic uptake may have prevented Eric from diving into the statistically-informed discursive uptake the prompt demanded; he said that in retrospect he “might have been able to do a better job explaining the process of how to draw the conclusions.”

## Discussion

Our analysis of student responses to the two prompts shows that even when assignments include some version of all of the features identified by researchers like Anderson et al. they do not always enable students to engage effectively with course concepts. This led us to look again at the Anderson et al. features communicated through the prompts to determine what led to the differences in students’ ability to articulate statistical concepts.

The feature of interactive writing processes was a constant across both of our WTL assignments: the *memo from a consultant* and the *email to grandparents*, both involved having students write drafts, engage in peer review, and receive feedback from an undergraduate writing fellow before revising and submitting their final drafts. Because both assignments used such similar processes, the difference in student performance could not be attributed to this feature. However, the other two features that Anderson et al. identify—clear writing expectations and meaning-making in writing tasks—deserve more attention.

As mentioned previously, Anderson et al. argue that instructors need to provide students with an accurate understanding of what they are being asked to do and the criteria by which instructors will evaluate their work to increase the likelihood that they can take advantage of the affordance of WTL activities. The two prompts discussed here did include detailed instructions along with rubrics for evaluation, but “clear writing expectations” did not anticipate the various forms student genre and discourse uptake could take. When students wrote to the Tour de France team, the register in which they wrote and their inclusion of course concepts addressed the social organization that accompanies a professional memo directed to a national organization. Based on students’ successful writing for this prompt, their uptake of this genre included statistical discourses with features like complex syntax, high-level register, and genre-appropriate tone, as befitting a consultant’s report to their client.

In the *email to grandparents*, however, student writing illustrates the extent to which high-level register features and explicit discussion of statistical concepts did not fit the expectations of this genre. The conflict experienced by students in our study is reminiscent of the incident that Nowacek describes, in which a student’s incoming knowledge of the genre of a personal diary interfered with the stated goals of an assignment where students were expected to write diary entries detailing the material conditions of medieval life. Although the student transferred her genre knowledge of



the diary genre by writing a personal, introspective account of her character's life, she missed the point of the assignment, which was to demonstrate an understanding of medieval life using the discourses of the field. Nowacek's study offers another example of how a prompt can lead students to demonstrate generic uptake and neglect the discursive uptake that can demonstrate their understanding of course concepts.

Communicating via a memo provided students with a more likely way, in Gogan's sense of approximating likeliness, to relay their statistical knowledge; students' and instructors' expectations were in alignment with how a professional communicates their specialized knowledge to an organization requesting their consultation services. Students as a whole did not fare as well in the genre of an email to their grandparents. Because the genre and audience for this assignment were not adequately aligned to the conceptual purpose of the writing assignment, students were presented with two contradictory sets of expectations. One sentence in the prompt tells students, "write your grandparents an email that explains to them what kinds of questions they need to ask before they can determine whether they are consuming too much caffeine" and a few sentences later, students are told to "include reference to the explanatory variable, response variable and any other confounding variables." As a result, students had to navigate between either a genre-appropriate informality or a display of proficiency in statistical discourses for the instructor-as-evaluator, often leading to a blurring of the two. The relatively small number of students who, like Amy, concentrated on the three variables required by the prompt succeeded with this prompt.

Finally, as discussed earlier, Anderson et al. found that students need opportunities to make meaning with their writing and to engage in integrative, critical, or original thinking (207). How easily students can make meaning within the constraints of a WTL assignment depends on several factors, among them distance and aspiration: What is the distance between the real situation of writing in response to a professor's assignment and the imagined rhetorical situation offered by the assignment? To what extent does the imagined rhetorical situation of the writing prompt tap into students' aspirations? What we found was that the closer the real classroom situation and imagined situations embedded in the assignment and the more aspirational qualities that were present in a prompt, the easier it was for students' uptake to demonstrate effective meaning making. As Eodice et al. found, student aspirations play a key role making writing meaningful.

In both WTL assignments, the genre required students to hold in their minds an imaginary audience and exigence that would direct the ways in which they made meaning in their responses. But the reality was that they were writing to a professor and some writing fellows for a statistics class at a large public midwestern university. The two rhetorical situations existed in dynamic tension for the student-writers who sought to write meaningfully for both audiences. We hypothesize that the tension was

somewhat easier to resolve when the real situation of writing for a professor and the imagined rhetorical situation of writing for, say, an employer were closer to each other rather than far apart. We conducted subsequent interviews with two other M-Write students, Amy and Eric, in order to shed further light on student uptake of these two prompts. These participants confirmed, too, that students' uptake focused on course concepts rather than rhetorical features demonstrated deeper conceptual learning.

Another dimension of students' uptake of these two assignments centers on the perceived stakes in each rhetorical situation presented. While each offered a clear context and audience for student writers, the grandparent audience led Eric's uptake, and probably that of many other students, away from providing detailed information about "what [the numbers] mean" because he was trying to make [his explanation] as informal as possible." In writing an email to their grandparents about something as pedestrian as caffeine intake, the stakes were fairly low. The grandparents may choose to follow the grandchild's recommendation or not—either way, little was lost or gained. On the other hand, part of what was at stake in the memo to a consultant is job performance, accolades, and possible future job opportunities. Those stakes are not unlike the stakes tied to course grades, at least from a first- or second-year student's perspective—doing well in a class will lead to good grades and possibly other opportunities (such as desirable internships) in the future. The students' writing task in the "memo as a consultant" was similar to a task they were used to doing: creating a product and having their performance evaluated.

Another factor that contributed to the students' uptake may have been the difference in how well students were able to make meaning in the *memo from a consultant* assignment as opposed to the *email to grandparents* assignment since the memo prompted students to imagine themselves as professionals while the email did not offer this aspirational connection. It gave many of them a way to make meaning beyond the classroom. By putting them in a role that many of them would aspire to, this writing-to-learn assignment let students borrow authority from that imaginary role, and perhaps write with more motivation and confidence as a result. The prompt's opening sentence, "You have been hired by the U.S. bicycle team to help them train for the Tour de France," makes the prompt a scaffold to a real-world activity, with a clear line from present work to future work. In Eodice et al's terms, this prompt invites students to be more agentive. In contrast, the *email to grandparents* did not contain the same aspirational or anticipatory socialization (Feldman; Lortie) in terms of career mobility. While some students might have been motivated by real-world applications outside the classrooms that allowed them to assist family members, the assignment didn't suggest any professional applications. There was not much borrowed authority to be had, and rather than creating a clear through-line from present work to future work, the grandparent assignment was a kind of cul-de-sac; a worthy end, perhaps,

but an end in itself and not a means of writing their way into a professional world. As Brandt suggests, “writing as worldly work’ functions aspirationally in the lives of young writers . . . , exciting dreams of their future selves and inviting them into precocious engagement with some of the most powerful genres of the culture” (97); it should come as no surprise, then, that when asked to take on a professional stance, students seemed more engaged and agentive as writers and as learners.

## Implications

We believe that the uptake we’ve witnessed in students’ interviews and written responses to these prompts have important implications for improving how instructors craft WTL assignments. First, our findings shed additional light on the importance of genre and disciplinary discourses. Instructors need to attend to how different genres with their attendant social organization, the roles and expectations they carry, create space for the display of certain kinds of knowledge. Genre, as Bawarshi notes, acts upon writers, leading to communication in different registers with different audiences. The chosen genre should create a broad platform for presenting conceptual understanding in the respective discipline. If the genre called for by the WTL assignment demands that the student make a choice between using disciplinary discourses showing what they know or writing well for the genre, it may impede rather than promote student success.

Instructors may also want to consider the distance between real and imagined rhetorical situations. If students are asked to write for a situation that is vastly different in terms of stakes and demands of ethos from writing to an instructor or professor in a college classroom, the tension may be counterproductive rather than generative.

Finally, a useful question to ask about an assignment is what kind of aspirational quality it has and in what way it might be perceived as a scaffold to a desirable future role. The way an assignment is constructed can go a long way toward supporting students in making meaning of their learning and clearly conveying their knowledge of course concepts.

This research may be particularly critical given Anderson et al.’s finding that well-designed writing curricula may have a positive influence on students’ “Personal and Social Development,” which they define as “learning independently, understanding oneself, understanding other people, developing a personal code of values and ethics, and contributing to the community” (211). In other words, well-designed WTL assignments (which, ideally would be integrated throughout the curriculum) may not only have positive effects on academic learning, but they may also influence students’ overall development, both as people and as global citizens.

## Works Cited

- Ackerman, John M. "The Promise of Writing to Learn." *Written Communication*, vol. 10, no., 3, 1993, pp. 334–70.
- Anderson, Paul, Chris M. Anson, Robert M. Gonyea, and Charles Paine. "The Contributions of Writing to Learning and Development: Results from a Large-Scale Multi-Institutional Study." *Research in the Teaching of English*, vol. 50, no. 2, 2015, pp. 199–235.
- Arnold, Kathleen M., Sharda Umanath, Kara Reilly Walter B. McDaniel, Mark A. March, and Elizabeth J. Marsh. "Understanding the Cognitive Processes Involved in Writing to Learn." *Journal of Experimental Psychology Applied*, vol. 23, no. 2, 2017, pp. 115–27.
- Austin, John L. *How to Do Things with Words*. Harvard UP, 1962.
- Bangert-Drowns, Robert L., Marlene M. Hurley, and Barbara Wilkinson. "The Effects of School-Based Writing-to-Learn Interventions on Academic Achievement: A Meta-Analysis." *Review of Educational Research*, vol. 74, no. 1, 2004, pp. 29–58.
- Bawarshi, Anis S. *Genre and the Invention of the Writer: Reconsidering the Place of Invention in Composition*. Utah State UP, 2003.
- Brandt, Deborah. *The Rise of Writing: Redefining Mass Literacy*. Cambridge UP, 2015.
- Durst, Russell K. and George E. Newell. "The Uses of Function: James Britton's Category System and Research on Writing." *Review of Educational Research*, vol 59, no. 4, 1989, pp. 375–94.
- Emmons, Kimberly. "Uptake and the Biomedical Subject." *Genre in the Changing World*, edited by Charles Bazerman, Adair Bonini, and Débora Figueiredo, The WAC Clearinghouse and Parlor Press, 2009, pp. 134–57.
- Eodice, Michele, Anne Ellen Geller, and Neal Lerner. *The Meaningful Writing Project*. Utah State UP, 2017
- Feldman, Daniel Charles. "A Contingency Theory of Socialization." *Administrative Science Quarterly*, vol. 21, 1976, pp 433–52.
- Ferris, Dana R. and John Hedgcock. *Teaching L2 Composition. Purpose, Process, and Practice*. Routledge, 2014.
- Freadman, Anne. "Uptake." *The Rhetoric and Ideology of Genre: Strategies for Stability and Change*, edited by Richard M. Coe, Lorelei Lingard, and Tatiana Teslenko, Hampton Press, 2002, pp 39–53.
- Gere, Anne Ruggles, Emily Wilson, Naitnaphit Limlamai, Kate MacDougall Saylor, and Raymond Pugh. "Writing and Conceptual Learning in Science: An Analysis of Assignments," *Written Communication*, forthcoming.
- Gere, Anne Ruggles, ed. *Developing Writers in Higher Education: A Longitudinal Study. U of Michigan P*, 2019.
- Gogan, Brian. "Expanding the Aims of Public Rhetoric and Writing Pedagogy: Writing Letters to Editors." *College Composition and Communication*, vol. 65, no. 4, 2014, pp. 534–59.

- Gunel, Murat, et al. "Writing for Different Audiences: Effects on High-School Students' Conceptual Understanding of Biology." *Learning and Instruction*, vol. 19, no. 4, Aug. 2009, pp. 354–67.
- Herrington, A. J. "Writing in Academic Settings: A Study of the Contexts for Writing in Two College Chemical Engineering Courses." *Research in the Teaching of England*, vol. 19, no. 4, 1985, pp. 331–61.
- Johns, Ann. "Students and Research: Reflective Feedback for I-Search Papers." *Feedback in Second Language Writing: Contexts and Issues*, edited by Ken Hyland and Fiona Hyland, Cambridge UP, 2012, pp. 162–81.
- Lortie, Dan C. *Schoolteacher*. U of Chicago P, 1975.
- Melzer, Dan. *Assignments Across the Curriculum: A National Study of College Writing*. Utah State UP, 2014.
- Nowacek, Rebecca S. *Agents of Integration: Understanding Transfer as a Rhetorical Act*. Southern Illinois UP, 2011.
- Ochsner, Robert and Judy Fowler. "Playing Devil's Advocate: Evaluating the Literature of the WAC/WID Movement." *Review of Educational Research*, vol. 74, no. 2, 2004, pp. 117–39.
- Patton, Michael Quinn. *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*. SAGE, 2015.
- Reynolds, Julie A., Chris Thaiss, William Katkin and Robert J. Thompson. "Writing-to-learn in Undergraduate Science Education: A Community-Based, Conceptually Driven approach." *CBE Life Science Education*, vol. 11, no. 1, 2012, pp 17–25.
- Rivard, Leonard P. "A Review of Writing to Learn in Science: Implications for Practice and Research." *Journal of Research in Science Teaching*, vol. 31, no. 9, 1994, pp. 959–83.
- Rounsaville, Angela. "Selecting Genres for Transfer: The Role of Uptake in Students' Antecedent Genre Knowledge" *Composition Forum*, vol. 26, 2012, compositionforum.com/issue26/selecting-genres-uptake.php.
- Schiavone, Aubrey and Anna V. Knutson. "Pedagogy at the Crossroads: Instructor Identity, Social Class Consciousness, and Reflective Teaching Practice." *Class in the Composition Classroom: Pedagogy and the Working Class*, edited by Geneesea M. Carter and William H. Thelin, Utah State UP, 2017, pp. 19–39.
- Swofford, Sarah. "Reaching Back to Move Beyond the 'Typical' Student Profile: The Influence of High School in Undergraduate Writing Development." *Developing Writers in Higher Education: A Longitudinal Study*, edited by Anne Ruggles Gere, U of Michigan P, 2019.

# More Than a Useful Myth: A Case Study of Design Thinking for Writing Across the Curriculum Program Innovation

JENNA PACK SHEFFIELD

In May 2017, my university sent me to the Association of American Colleges and Universities (AAC&U) Institute on General Education and Assessment in Chicago, Illinois. In addition to enjoying the deep-dish pizza and rediscovering student life through sleeping in dorm rooms, I had the pleasure of hearing Stanford's Helen Chen, their director of e-Portfolio Initiatives, discuss the institute's theme: *design thinking*. At the time, I had been the director of my university's fledgling writing across the curriculum (WAC) program for two years, and while I was not at the institute in that capacity, I quickly went from being slightly skeptical about the concept of design thinking to, instead, not being able to ignore all of the ways in which design thinking could be employed in the context of WAC program design and sustainability. As Chen spoke, I kept seeing ways in which this concept could potentially invigorate our program.

As such, in this article, I argue that design thinking can be used as a strategy for addressing structural or curricular problems in WAC programs. I begin by describing how design thinking has been defined in other fields such as engineering and architecture. I then define the Stanford d.school's five modes of design thinking and discuss how I applied these modes to a design-thinking process in my own university's WAC program to address problems related to faculty resistance and meeting students' needs. I end by explaining how other administrators may use this interdisciplinary heuristic to analyze and wrangle with administrative WAC problems.

## Decoding Design Thinking

Put simply, design thinking is a creative problem-solving approach. It is typically employed in the context of architecture and art/design disciplines but has more recently been applied in engineering, business management, and education contexts as well (Matthews and Wrigley; Purdy; Rowe). Many companies, such as global design company IDEO and General Electric, now use design thinking as a tactic for inciting new innovations regarding anything from re-structuring departments to creating new products (Brown; Moggridge). At least in business settings, design thinking has proven to have favorable outcomes, including better economic performance in the marketplace (Matthew and Wrigley; Moultrie and Livesey).

Essentially, engaging in design thinking means applying a designer's mindset or sensibility to complex or "wicked" problems. Drawing upon the theories of Horst W. J. Rittel and Melvin M. Webber, Richard Marback writes in a 2009 *CCC* article that *wicked problems* are "not solvable through greater command of information. Wicked problems are wicked because they are never finally solvable" (W399). These ill-defined problems, according to *Design Thinking* author Peter Rowe, have no definitive formulation (41). In fact, Rowe suggests, different formulations of the problem at hand imply different solutions, and proposed solutions to wicked problems are not necessarily correct or incorrect because plausible alternative solutions could be proposed (41).

To contend with so-called wicked problems, designers are said to employ a design-thinking approach. Richard Buchanan, inspired by Rittel and Webber's wicked problems concept, defines design thinking as problem-solving activity but also as reflective practice, emphasizing the connection between theory and practice. In "Wicked Problems in Design Thinking," Buchanan takes a process perspective, breaking down four areas of the world in which design is explored—symbolic and visual communications (such as graphic design), material objects, activities and organized services, and complex systems or environments for working, playing and learning (Buchanan 9–10). In other words, design thinking is a reflective practice that can be applied to a wide variety of subject matters, processes, and products. While Buchanan's work is relatively theoretical, some scholars and practitioners have also made moves to formalize methods for engaging with design thinking. As James Purdy notes in "What Can Design Thinking Offer Writing Studies," John Chris Jones, who was the "founder of the design methods movement," established a three-step process: "diverge, transform, converge" (Purdy 627). For Jones, design begins with divergence, in which the designer brainstorms and researches, escaping old assumptions and discovering what the problem actually is that the designer is attempting to resolve (64). Transformation is a creative phase involving setting objectives, identifying critical variables, and finding patterns, which ultimately allows designers to define the problem (Jones 66). Then, convergence involves selecting an appropriate solution to the problem.

Tim Brown, CEO and president of global design company IDEO, also writes about specific design-thinking methods in his book, *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. Having successfully employed design thinking for countless projects in his firm, Brown suggests there are three "overlapping spaces" of design thinking: inspiration, ideation, and implementation (16). Perhaps inspired by Jones, Brown describes the inspiration space as the space in which ideas are gathered; ideation involves turning insights into ideas; and implementation means turning ideas into a concrete action plan (Brown 16). Brown also suggests that design thinking is a dance between four mental states: convergent

thinking (eliminating options and making choices), divergent thinking (multiplying options to create choices), synthesis (putting pieces together to form a whole), and analysis (breaking apart complex problems) (66–71).

Many of these ideas from Brown and Jones are present in the “design thinking” modes articulated by the Stanford d.school, which is the model that I use throughout the rest of this article. The Stanford model articulates five modes: empathize, define, ideate, prototype, and test. In the sections that follow, I describe these modes in more detail. No matter what method is being used, all design thinking practitioners emphasize that it is primarily about human-centered innovation (rather than technology or organization-centered innovation), and it is an iterative, collaborative process.

It is important to note that design thinking has been critiqued as well, with some suggesting it is little more than an empty buzzword. Don Norman, the founder and director of the Design Lab at the University of California, San Diego and former VP of advanced technology at Apple, writes in a 2010 online article that design thinking is a “useful myth.” Norman’s point is that design thinking is nothing more than a name for something innovators have been doing “throughout recorded history, long before designers entered the scene” (“Design Thinking: A Useful Myth”). In other words, breakthroughs in a variety of fields stem from people and processes that do not need to apply the term design thinking to what they do. Norman implies that design consultancies even use the concept as a public relations tool to mystify the work they do. Yet, Norman revisits his position a few years later in “Rethinking Design Thinking.” He suggests that while, yes, design thinking is practiced “in some form or another by all great thinkers,” in design, “there is an attempt to teach it as a systematic, practice-defining method of creative innovation” (Norman, “Rethinking Design Thinking”). For Norman, design thinking is critical as a way to encourage individuals and teams to “question the obvious, reformulate our beliefs, and to redefine existing solutions, approaches, and beliefs” (“Rethinking Design Thinking”). In short, design thinking is the application of a tried and true process for tackling complex issues and opportunities that is used by those with and without design backgrounds.

While the concept of design thinking is typically used in engineering, architecture, design, and even business management contexts, the concept has indeed been invoked in rhetoric and composition scholarship. Most notably, Carrie Leverenz argues in “Design Thinking and the Wicked Problem of Teaching Writing” that writing instructors should teach writing as a design process, create wicked writing assignments, and foster experimentation through prototyping. In “What Can Design Thinking Offer Writing Studies?,” James Purdy draws comparisons between the multimodal composing process and design thinking. However, design thinking, to my knowledge, has not yet been applied to WAC. While Purdy does acknowledge that design thinking offers a model for how we might think about situating writing in



the academy, his focus is more on the parallels between the composing process and design thinking as he codes composition journals for the different ways in which they invoke the concept of design (620). In this article, I want to suggest that design thinking can be applied productively to WAC administration, specifically.

While most of the WAC literature focuses on practical tips for program administration based on narratives of experienced administrators or on theorizing writing pedagogy rather than program administration, Michelle Cox, Jeffrey Galin, and Dan Melzer's recent book, *Sustainable WAC: A Whole Systems Approach to Launching and Developing Writing Across the Curriculum Programs*, does theorize program administration, drawing from theories outside of the field. Cox, Galin, and Melzer offer a theoretical framework for WAC program development grounded in complexity theory and systems theory. While systems thinking and design thinking developed independently in different fields (engineering/biology versus architecture/design, respectively), these approaches have some similarities and even overlaps. Systems theory involves thinking at the institutional level about the ways in which systems shape behavior (Cox, Galin, and Melzer 17). It is a recursive process that requires involving "actors in the system" in an attempt to "paint a rich picture of the system" (Cox, Galin, and Melzer 32). To employ this approach, for example, the authors describe a WAC director gathering a group of stakeholders to consider their goals for writing on campus, create alternative models for the system, and look for points of leverage for making change. In many ways, a design-thinking process would look similar. One of the major differences is that in systems theory, the stakeholders are the designers (in this case, the WAC director and, say, a campus writing committee), whereas in design thinking, the stakeholders are those observed and studied by the design team, such as students and faculty (Pourdehnad, Wexler, and Wilson). In other words, design thinking seems to more strongly emphasize a human-centered approach involving empathy with "users"—or the individuals/group for which one is designing. Another difference is that while systems thinking is more about seeing wholes (interrelationships rather than things (Shaked and Schechter), design thinking involves a "dance among four mental states"—convergent thinking, divergent thinking, analysis, and synthesis (Brown 66–71). Yet, the holistic approach to analyzing a system that is embodied in systems thinking can augment the creative idea development process of design thinking with greater consideration of the complexities of a system and power dynamics. Systems thinking may be more valuable for initial program development, but design thinking can be rather quickly (depending on the context and goals) and cheaply applied for innovation at any stage of a WAC program's lifespan. Brown reminds readers about the value of design thinking when he says, "Design thinking taps into capacities we all have but that are overlooked by more conventional problem-solving practices" (4).

## The “Wicked Problem” of WAC

If design thinking is supposed to be applied to wicked problems, then the first question we as administrators might ask ourselves is, “Is WAC a wicked problem?” I would argue that both the acts of implementing and sustaining a WAC program can pose a variety of wicked problems worth exploring, and using wicked problems as a construct for understanding problems in WAC may allow us to address these problems differently.

There are a variety of common problems that WAC program administrators find themselves faced with. Many struggle with how to assess program effectiveness or monitor instructor compliance (Bazerman et al.; Carter; Cox, Galin, and Melzer; McLeod); how to deal with resistance from chairs to support faculty course releases or lower class caps or resistance from faculty who are frustrated by top-down, administratively launched curricular initiatives or who feel overburdened (Sandler); how to work with faculty who may be overly focused on grammar instruction to the detriment of higher-order concerns (Cole); or more generally how to deal with disciplinary differences in writing conventions and pedagogical approaches (Sandler). Some are faced with questions of who owns WAC and where WAC should be located in terms of place or administrative affiliation, and others worry about student perceptions of writing-intensive courses, noting that students (often at the advice of advisors) shy away from these courses due to concerns that the courses are more work (Cox, Galin, and Melzer 82–85). The sustainability of WAC programs is also an important issue arising in recent books and articles, and many of the above problems are why administrators worry about the sustainability of their programs.

These issues can be considered wicked problems because there is not necessarily one correct answer. Various solutions can be provided, and sometimes the actual problem itself is difficult to define. The problem also changes shape depending on the stakeholders under consideration, and the problem itself may change as one works to try and address it. Possible solutions to the problem also vary depending on the context. Traditional processes cannot solve wicked problems; these problems, in fact, cannot be indefinitely solved but they can be moderated or tamed. To illustrate, consider the question of where WAC should be located in terms of administrative affiliation. Does WAC belong to the English department? Should it reside in a center for teaching and learning (CTL)? Should it be run by a full-time administrator or a faculty member with a course release, and who does the director/coordinator report to? Different stakeholders would have different answers to these questions, and their answers are not necessarily right or wrong. Based on a concern that few faculty are participating in the WAC program, the Provost may pull WAC out of the English Department and into the CTL because he feels faculty across campus do not see WAC as interdisciplinary, but this may cause problems for the English department faculty who feel writing

is their territory. Perhaps the move out of the English department does garner broader interdisciplinary participation, but the director, who has an English background, leaves out of frustration, and a director who lacks a writing background opens up new problems. Perhaps the problem was not really about faculty disliking that WAC was owned by the English department and the move to the CTL does not boost participation—hence the problem itself was not clearly defined. Perhaps engineering faculty do not want WAC under English but business faculty do, so the problem changes shape depending on which faculty are being considered.

Looking at WAC problems as wicked problems might, at first glance, cause an administrator to think that she should not even bother trying to work on these problems because they seem so impossible. However, this construct should actually empower us to feel that we can manage problems while reminding us that it is perfectly acceptable that we will be unable to find one perfect answer. In other words, the wicked problem concept has the potential to encourage administrators to tackle a problem that they might have otherwise deemed beyond their control or abilities. Identifying a wicked problem in WAC administration can remind us to focus on a specific user (the person or group for which we are trying to solve a problem) and to design a “solution” based on the specific stakeholder we want to address at any given time. Designating these problems as wicked also helps us to consider all the various complexities inherent in a problem and reminds us that new problems will emerge as we work on taming the initial issue; the wicked construct can help us troubleshoot and plan ahead. Ultimately, design thinking, and particularly the five modes I discuss in the next section, will help WAC administrators wrangle with these wicked problems. Yet, as Barbara Walvoord notes in the “Getting Started” chapter of Susan McLeod and Margot Soven’s *Writing Across the Curriculum: A Guide to Developing Programs*, we should avoid the problem-solution model of WAC because if “WAC is seen only as a solution to a particular problem, then everyone expects that, if WAC is successful, the problem will be solved and WAC can end” (11). While the concepts of wicked problems and design thinking deal with the notions of problems and solutions, these concepts actually allow us to avoid this problem-solution model because they remind us that the kinds of problems we are faced with will continue to transform, and we will need to continually innovate, collaborate, and adjust.

At my university, there are a variety of wicked problems that I could attend to, but in this article, I focus on the most pervasive—which is the university’s inability to offer enough writing-intensive courses to meet student demand. First, I will offer some context about our program and my role in its leadership. I started as the writing across the curriculum director at the same time that I first joined the faculty as an assistant professor of English. The university was in the process of implementing a new core curriculum, which would include one writing-intensive (W) course that all students

would be required to take prior to graduation. As part of this change, the university removed one of our two required first-year writing courses. As a new faculty member, I was not privy to many of the conversations that led up to this change. I was not clear on the motivations behind the decision to implement WAC, nor did I know who made the decisions. Even after asking a variety of stakeholders to clue me in, I never really received the solid answers I was looking for. It *was* clear to me, however, that many faculty were resistant to this change. The “good luck with that” joke and chuckle that accompanied any conversation I had about WAC was a good indicator, and I was also warned by my chair and a Core Curriculum Task Force Committee that it would be difficult to get some chairs and faculty on board.

The major aspects of the “W” requirement and certification process were decided on before I arrived. We have a WI-based WAC program that follows an instructor-based approach, meaning that the W course designation is attached to sections of courses taught by instructors who have participated in our full-day orientation workshop and completed a course proposal. The proposal requires faculty to demonstrate how their courses meet the W requirements, such as that instructors should offer explicit instruction in writing, assign writing to learn (WTL) activities, give feedback on writing, and engage students in revision. During the semester they teach the W course, faculty are also asked to attend one 1-hour workshop to continue the professional development opportunity. W sections are currently a mix of general education courses and upper-level courses in the major, and section offerings have grown from ten to approximately twenty-five a semester, but by next year (AY 2019–2020) we need to be at around forty sections per semester to meet student need. When I arrived, I wrote a proposal to the provost to request a faculty stipend for those who would teach W courses, and the negotiated result was a \$500 “start-up” stipend offered once—hence, the stipend is associated with participation in the workshop and proposal process and paid out during the semester the faculty member first teaches the W class, but faculty who teach courses again do not receive any compensation or release. Based on what was agreed to in relationship to the stipend, I was quite concerned about the sustainability of the program. Some faculty were motivated by the twenty-person class cap, such as history faculty who already taught writing-heavy sections with 30–35 students, but others’ courses were already capped at 18–20 for a variety of reasons.

By the time I was introduced to design thinking, my initial sense of my program’s wicked problem was that we did not have enough W-designated courses to meet the core curriculum requirement, which was ultimately a question of program sustainability. Given that sixty-two percent of the National Census of Writing WAC program respondents indicate that their institutions require all students to take writing-intensive courses taught by departments other than English or writing, this is likely

a common problem. This problem also seems straightforward at first glance, so why did I consider this a wicked problem? Primarily because there was no easy answer and because different formulations of the problem would require different solutions. For example, the problem could have been that we did not have enough courses because my communications and recruitment were not effective, or, instead, we did not have enough courses because faculty wanted compensation for teaching the courses because they perceived them to be extra work. It could have been that faculty did not want to deal with students' resistance because many of our students did think W courses were "more work." The issue could also have been that department chairs could not afford to cap classes at twenty students. These different formulations of the problem would obviously lead to different approaches to a solution. Depending on the variety of problems and the different stakeholders facing these problems, I would need to tackle the issue in different ways—and I did so by drawing on concepts from design thinking.

## A Case Study in Design Thinking for WAC

To apply design thinking to WAC, I used the Stanford d.school's design-thinking model—not only because it was the model that influenced me at the AAC&U Institute but also because it is arguably the most prevalent contemporary model invoked by businesses and academics, as Stanford is "at the forefront of applying and teaching Design Thinking" (Interaction Design Foundation). While these modes—empathize, define, ideate, prototype, and test<sup>1</sup>—are typically presented in order, they are intended to be iterative. In what follows, I define each mode, and after the mode's definition, I explain how I used that mode to tackle my program's wicked problem. While I wish I could share that I have engaged in a full-scale design-thinking process with a large team and measurable results, my own attempts at and successes with design thinking are certainly a work in progress; however, I would like to share a few elements of how design thinking informed some innovations on my campus.

### *1. Empathize*

The first mode, empathize, is perhaps the most important of all modes because of its emphasis on a human-centered approach to creative problem solving.<sup>2</sup> Before a

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1. Some scholars, such as Purdy, draw on a six-step process delineated by Jim Ratcliffe on the d.school K–12 wiki, but the most current instantiation by Stanford has five steps. Ratcliff's model includes understand, observe, define, ideate, prototype, and test. The current model takes "understand" and "observe," lumping these into the category of "empathize."

2. Many of the tools and methods mentioned in this section are drawn from the Stanford d.school's "Design Thinking Bootleg Deck," which is the latest iteration of strategies available on their website that were created by students, faculty, and designers from around the world.

designer can solve a problem, she needs to identify the user (the people for which she is trying to solve a problem) and truly understand their concerns. In this mode, the designer (1) *observes* users in the user's context, (2) *engages* users through interactions such as interviews, and (3) *immerses*, which essentially means that the designer wears the user's shoes, aiming to personally experience the reality of the user (d.school Hasso Plattner Institute of Design at Stanford i).

In this mode, the designer is supposed to assume a beginner's mindset by avoiding value judgments, questioning everything, finding patterns, and truly listening (d.school Hasso Plattner Institute). It is suggested that asking many "why" questions will help designers access empathy. This process ultimately is intended to help designers (in this case, WAC/WID directors) "grasp the needs of people you are trying to serve," according to Brown (9).

The elements of design thinking that inspired me the most, when I heard Chen discuss the concept, were the empathy mode and the iterative nature of the process. As such, I came back from learning about design thinking inspired to learn more about the faculty I work with and embracing the fact that I should go back and make changes to my program based on what I learned from these insights. This is not to say that prior to learning about design thinking, I did not care about or think about the faculty across my university. Quite the opposite. In fact, there were likely times when I worried too much about what they thought or felt; however, I had not specifically taken an opportunity to be *strategic* about determining their needs and feelings.

To engage with the empathy phase in my own design-thinking process, I first had to determine my users. Although the ultimate issue was related to students' needs, my users were faculty—faculty who I needed to continually teach W courses so that we could offer enough sections. Having the empathy mode in the back of my mind helped me to see that I needed more one-on-one time with the instructors where I gleaned their emotions about the program without allowing my own insecurities, biases, or assumptions to get in the way. To observe, engage, and immerse, I made a key change to my normal program structure. In lieu of our typical one-hour required mini workshop, I instead asked each faculty member to come to a 30–45 minute meeting in my office. By this time, I felt that I had a strong enough relationship with most of the faculty (I was in the third year of my program) that they would understand my intentions were not to police them but to learn from them. Luckily, I did have some program dissenters in this group because a few of the faculty had been strong-armed into the program by their chairs. This allowed me to garner the perspectives of a range of faculty. While I framed these meetings primarily around me being a resource for them, I also took the opportunity to engage them by asking many questions about

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the workshop and course development process, how their course was going, what concerns they had about students' writing, if they would continue to teach W courses in the future, and why or why not. Especially for those who were resistant to being a part of the program or were not likely to teach a W course again, I was reminded by design-thinking principles to dig deep—moving beyond just the fact that faculty were resistant to trying to discover the exact *sources* of the resistance.

I also asked them to bring in course materials, such as a graded student paper or a rubric or a writing activity handout, so we could workshop their materials. This also enabled me to observe them in context. While this is not quite the same as sitting in on one of their classes or asking them to use a think-aloud protocol while grading (these strategies would perhaps better embody the “observe” category of the empathy mode), I selected an approach that felt natural and embedded in the local context. It did allow me to put myself in their shoes as I looked at the writing they received from their students or learned about their assessment struggles.

Another way I learned from stakeholders in the empathy phase was to begin surveying them. Much like I am sure other WAC directors do, I created a post-workshop survey, a student-experience survey, as well as a survey sent to department chairs for feedback about the process. I also held “WAC open office hours,” or information sessions, that were open to anyone on campus. The main goal was to answer questions about the W process, but it also gave dissenters the opportunity to give me feedback on the program. While these information sessions were not terribly well attended, I did get the opportunity to speak to a few people who might have otherwise never taken the opportunity to present me with their perspective.

These informal interviews, surveys, and information sessions helped me gather a range of opinions and insights, looking for patterns that helped me formulate a more specific problem definition, which I discuss in the following section.

## 2. *Define*

After a designer engages with the empathy mode, she begins to *define* the problem. It is important to use the insights gleaned from the empathy mode in order to carefully craft a definition of the problem at hand. Rather than just calling it a problem statement, design thinkers call this a “point of view,” which is an actionable problem defined by the user insights (d.school Hasso Plattner Institute ii). A strong point of view, according to the Stanford Bootleg Deck, allows for the generation of many possibilities and preserves emotion. In defining the problem, the Stanford team suggests describing the user and choosing your favorite insight that “represents the most powerful shift in your own perspective,” then articulating what would be game-changing for the user, assuming the insight is correct (11). Perhaps the tip most poignant to WAC administrators is the d.school's assertion that a good point-of-view is one that

“saves you from the impossible task of developing concepts that are all things to all people” (“An Introduction to Design Thinking” 3). How many administrators have tried to come up with a solution to a problem that makes everyone happy and ultimately failed? Design thinking emphasizes that a strong problem statement narrows the issue enough that the administrator does not have to please all people—only the specifically identified stakeholders on a specifically identified, actionable issue.

For my own design thinking activity, I used what I learned in the empathy phase—from the surveys and interviews and discussions of course materials—to more clearly formulate a problem. Based on what I learned in the empathy phase, the clearest two issues I could see were that (1) faculty felt insecure about how to manage the grading load and give enough in-class time to instruction about writing, which made them not want to teach a writing-heavy course, and (2) they felt teaching this type of course was extra work with little compensation. What came as a surprise to me was that a course release was considered much more valuable to most faculty compared to a stipend. The emotions behind this seemed to stem from faculty feeling overworked and undervalued, which is certainly not an uncommon phenomenon. I was also not surprised that the faculty members were concerned about the grading load, but I was not aware that so many were struggling with finding time to offer explicit writing instruction in class or that this issue was enough to make them not want to run a W class. Because writing is the content in most of my courses, it was difficult for me to get past my own biases and common practices to realize this was an issue. I was also surprised to learn that the faculty did not have a problem with our instructor-based approach because they saw how people teaching other sections of the same course may not use writing pedagogy strategically, and they did not have a problem with the proposal process, which was something I had worried was burdensome for the faculty and could cause them not to create a new W class.

As such, I had a more unique point of view to work with moving forward, one that allowed me to focus on specific issues and get rid of certain concerns of my own that I realized were not major problems. According to the Interaction Design Foundation, a good problem statement focuses on your users’ need rather than your own. So, I had to keep faculty’s needs in mind above my own need for more W courses. While my wicked problem was the overall issue needing resolution, my point of view as I moved into the ideate phase was slightly different. According to the foundation, designers need to combine three key ideas: user, need, and insight. Applying this to my scenario, my problem may have been defined as such: Faculty (*users*) need to feel adequately compensated and supported (*need*) because they are concerned about the grading load and having adequate time to offer writing instruction in class, and they ultimately feel undervalued (*insight*). This problem was defined broadly enough to allow for the generation of multiple ideas, but it was specific enough to be approachable.



### 3. *Ideate*

The next mode, *ideate*, is where ideas are born. The key to ideating, in design thinking terms, is to come up with ways to solve the actionable problem statement by generating as many ideas as possible, suspending judgment (Purdy 627). As such, the goal is quantity over quality, and most of the literature on design thinking argues that design thinkers at this phase should not initially consider constraints (a difference between design thinking and systems thinking) so that they can move beyond obvious solutions. One of the goals of ideation includes uncovering “unexpected areas of exploration,” likely because constraints are not there to impede great ideas (iii). Yet, in some models, such as Tim Brown’s, constraints are acknowledged, but in a different way than a more traditional approach to change. Brown suggests that designers discover which constraints are important and establish a framework for evaluating them. These constraints—feasibility, viability, and desirability—are overlapping, and a design thinker is to bring these in balance (18). With any model, the key seems to be to avoid letting a particular constraint get in the way of innovative ideas. In other words, designers should at least avoid passing judgment or evaluating ideas in the early phase of idea generation because the best innovations often stem from what some may view as bizarre ideas. As Brown notes, starting with the constraint of what will fit within current models makes change slow and incremental (Brown 18–22). Designers begin to build constraints back in more strategically as they begin to prototype and test.

Most of my program’s ideation phase was conducted with the help of our first-year writing director and our writing programs coordinator, in addition to a session with my campus WAC committee. One particularly fruitful session during a reading day involved mapping out on a whiteboard our programs’ (writing across the curriculum, first-year writing, and the writing center) successes, goals, gaps, and connections, and considering innovative possibilities. We also worked to ensure that what I had learned in the empathy phase was connected to the ideas we generated. We produced a wide variety of ideas focused on our defined problem. It was quite difficult to avoid passing judgment and throwing out ideas that did not seem feasible, but having design thinking in the back of my mind did help me focus on avoiding assessing quality in the early phases. This is the point in which, during any normal change process, I likely would have thrown out some of the ideas that we ended up succeeding with.

We selected three main ideas to move forward into prototyping. The d.school recommends creating voting criteria, such as “the most likely to delight,” “the rational choice,” and “the unexpected” (“An Introduction to Design Thinking”). While we did not use these specific terms to categorize our ideas, we did ensure the ideas ranged from practical to risky.

1. Our most “outlandish” or “unexpected” idea was to propose what we called a W banking system. Faculty would be able to “bank” credits each time they taught a writing-intensive course, and after four credits they would receive a course release, during which time they could catch up on research or work on designing new courses, and so forth. This idea was risky because it would be costly to backfill courses and was unlikely to get support from central administration; however, while I normally would not have let this idea even come out of my mouth, we aimed to take it seriously in the prototype phase. We felt that this idea could address the issue of faculty feeling better compensated and valued for their work.
2. Another idea, the “rational choice” in the d.school’s terms, was to ask for more top-down support from the provost and deans, simply beginning to make it an expectation that faculty regularly participate in these processes. Part of the idea was to request that the expectation to teach a W course be built into the faculty handbook and into new faculty orientation. I had already been making suggestions along these lines, but the problem was how to make this happen in a meaningful way (or how to make administrators listen).
3. The third idea, perhaps the “most likely to please,” was the implementation of a writing fellows program. While there are many different instantiations of writing fellows programs, our goal was to make fellows available only to writing-intensive faculty, and the fellows would be experienced writing center tutors who would work closely with W faculty to offer writing workshops to students focused on discipline-specific writing strategies articulated by the faculty member. We felt this option might best help support faculty who were concerned about the grading load and in-class instruction, as the tutor and faculty member could collaborate about how to improve student writing and move some instruction outside of normal class time. (Importantly, writing fellows do not grade for the faculty.) While many other universities already have a writing fellows program, our university writing center was only a few years old and without this process, we likely would not have made a step in this direction for a few more years because we were perhaps not as aware of faculty needs . . . or perhaps not as willing to take on risks.

#### 4. *Prototype*

When a good idea is selected (or, ideally multiple ideas are selected), designers begin to *prototype*, which simply means to put the idea into any physical form. While this seems the most obvious for products, almost any idea can be prototyped. A new

organizational structure for a business can be plastered up on Post-It Notes, or a role-playing activity can be designed to enact a new way for handling customer service scenarios. A design-thinking prototype should be created cheaply and relatively quickly. According to Brown, a prototype “should only command as much time, effort, and investment necessary to generate useful feedback and drive an idea forward” (90). This quick approach is due to the fact that the purpose of prototyping is to generate conversations and allow the team to learn, explore, and test. Brown even notes that a more refined prototype might not receive as much feedback because it feels complete. In fact, prototyping is often conducted on multiple ideas to help a team decide which to move forward with.

We began prototyping for our writing fellows program idea by using a mind-mapping approach on a whiteboard and then later composing an outline. This outline turned into a proposal written by our writing programs coordinator to myself and the first-year writing director about the ins and outs of the writing fellows program. Once we gave our coordinator feedback, we asked her to then turn it into a more formal proposal directed at the provost, which would include some changes in our overall budget request for the upcoming year.

For the banking system idea, I again used the genre of a proposal for prototyping because a proposal would eventually have to be directed through the provost. As the d.school recommends, I used this proposal prototype to “start a conversation,” “test possibilities,” and “problem-solve” (“An Introduction to Design Thinking”). As I worked on the prototype proposal, I decided that this idea would have a better chance of getting off the ground if it was framed around our university’s emphasis on expanding high-impact practices (HIPs). As such, I started conversations with our service learning director, common course coordinator, and honors program director to test possibilities. We refined the idea to suggest that faculty who taught four high-impact courses (service-learning, honors, common course, writing intensive) could bank credits towards an eventual course release within a three-year timeframe. We created a variety of stipulations and requirements, and we added a portfolio requirement for students and faculty for program assessment. Portfolios were something the university had wanted but had been unable to get traction on, so we felt this was a good opportunity to garner further support by connecting our proposal to broader university goals. Another major university priority that had not been getting enough traction was our goal for a center for teaching and learning (CTL). As such, as we prepared our “high-impact practices incentive package,” we described how we envisioned this opportunity leading to the creation of a CTL in which those instructors being honored for teaching high-impact courses would become CTL teaching fellows.

Related to feasibility, a major constraint we came up against as we prepared our prototype was that even if we created this incentive for faculty, we could get

bottlenecked by chairs because getting buy-in for our courses is related to department needs. In this way, creating the prototype actually led to a redefinition of the problem because chair buy-in was not originally an issue that I discovered in the empathy phase. To offer an example, W and service-learning courses are capped at twenty, so chairs cannot always afford to cap classes at twenty because they have to find adjuncts to teach additional courses or sometimes have courses they cannot staff with adjuncts. As such, we also wrote into the proposal different ideas for department-level incentives; these ideas ranged from priority classroom selections for departments offering the most HIP courses to small budget increases for the most active departments, with the extra money going towards taking students to conferences. It was incredibly helpful to involve the other campus administrators in this process, as they each brought unique ideas and reminders of constraints to the prototype phase.

For our second idea related to top-down support, we used a white board and Post-It Notes to begin drafting what we called a “quota system.” A major challenge with getting top-down support for WAC in the early stages at my university was that there was no accountability. For example, a dean could strongly encourage departments to start creating W courses, but the departments were not being required to do so and nothing negative happened if they did not participate. Of course, it would be terrible if the university could not meet student need, but somehow because this was everyone’s problem, it was also no one’s problem. Our attempt with a quota system was to arm the provost with specific numbers the university would need. When we ideated, we came up with different approaches, such as asking for an even number of W courses to be taught across all five of our colleges, making it a requirement that each faculty member teach one HIP class each year as part of their yearly contract, and so forth. Yet, we finally settled on the following: We first determined how many W courses were needed across the university, and we then broke that down by the *percentage of instruction* offered by each of the university’s colleges. That then gave us a recommendation for the approximate number of W sections each college should offer. While this was only a rough estimate, it would give us something to work with that held each college accountable based on the amount of courses taught overall within the college.

As we prototyped, we began to see two ideas merging together. The quota system was helpful but still did not necessarily offer much motivation on its own. As such, we worked the quota system into our high-impact proposal, suggesting that a college’s ability to meet these numbers would also serve as a way of measuring the proposed department-level or college-level incentives. Remembering to always go back to what we learned in the empathy mode helped us stay on the right track as we continued making changes to the proposals. We saw that we needed more than one solution,

as the Writing Fellows program would give more pedagogical support while the HIP proposal would help faculty feel valued and better compensated.

### 5. *Testing*

The final mode, testing, means taking the opportunity to receive feedback on the prototype and refine the solutions. The Stanford team suggests, “Prototype as if you know you’re right, but test as if you know you’re wrong” (v). In other words, the testing mode is the time to be critical and consider the feasibility of the prototype. This mode may indeed reveal that the designer has framed the entire problem incorrectly. It can be useful to let the user experience the prototype without the designer offering a lot of context that could influence the user’s experience.

For my context, testing was difficult because we could not exactly enable users to experience our prototypes. However, we did share our ideas with as many constituents as possible throughout various phases in the process (W instructors, department chairs, associate provosts, the faculty senate chair, and more), and we did so even when our ideas were early, sketchy drafts. One important decision we made was to call both the writing fellows program and the HIP incentive packages “pilots,” and as such, we will be testing them, learning from users, and likely going back to the drawing board as we learn, engaging with the recursive nature of design thinking. Figure 1 shows a visual representation of the design-thinking process for our program’s particular wicked problem.

Again, perhaps one of the most important points about the design-thinking process is that it is iterative. As figure 1 shows, testing and prototyping were particularly iterative for us because we continually made changes as we received feedback. At every step, the WAC team should consider how what they learn in one mode informs the other and may require changes to ideas, solutions, or prototypes.

I am pleased to share that the writing fellows program was easily approved. W faculty already eagerly signed up for our pilot, filling the program within an hour of the invitation email. We feel that this additional layer of support will motivate faculty and help them feel supported. A much larger win for us will be the HIP proposal. It was indeed tentatively approved by the provost and shared with campus deans and associate provosts. The potential budget impact is now being explored by campus stakeholders, and while we have not yet been guaranteed that this program can begin in fall 2018, it looks promising. Perhaps even more significant, talks of a campus CTL have ramped up largely in the context of these conversations about the incentive proposal. We feel these programs will connect well to the concerns that were prioritized during the empathy phase.

## "Wicked" Problem: Program Sustainability Through Adequate Course Offerings

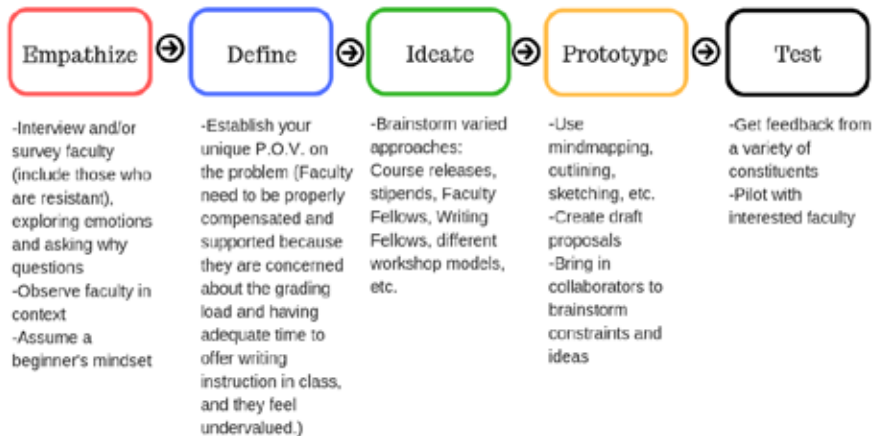


Figure 1. Design Thinking Map for Program Sustainability Issue

Given that wicked problems are shifty and never fully resolvable, we know we will need to continue to innovate. It remains to be seen if these initiatives will meet the goal of satisfying students' need for W courses, but we are confident that our approach is directly connected to faculty's concerns. We also have back-up plans in place in case our HIP proposal does not get final approval, and many of those ideas were also part of our ideation phase. However, the design thinking process certainly got us further than we would have gotten without it.

As I have noted, my own foray into innovation was certainly inspired by design thinking, but I also did not come close to exhausting the different ways in which design thinking can be applied to a variety of scenarios. There are many other innovative ways of working through wicked problems with design thinking. In the empathy mode, WAC directors could observe a faculty member while he or she grades papers using a think-aloud protocol. The director could run a W class herself or try to write a paper in another discipline in an attempt to "step into the students' shoes". She could partner instructors for classroom observations and collect and analyze the results to garner empathy insights. In the prototype mode, administrators can use mindmapping, sketching, outlining, storyboarding, and even role playing, such as acting out

a committee's reactions to a new process change. Testing can occur in a variety of ways—from users actually using a mock product to users reviewing the org chart for a new reporting structure and offering feedback. The WAC director may sit in on a class if a new classroom pedagogy is being tested. There are innumerable ways to enact the five modes.

## Applications for WAC Administrators

Design thinking allows WAC administrators to learn more about their programs and their problems with an eye toward focused solutions. The empathy mode encourages WAC administrators to (1) avoid bringing in their own biases or assumptions and (2) experience what their local users experience by actually witnessing their feelings, emotions, and challenges, rather than making educated guesses about these aspects of the users' experiences. The define mode allows administrators to hone in on a specific problem, making it more manageable and focused. This mode also encourages administrators to ensure that the problem definition is strongly connected to the empathy insights. The ideate mode allows for the generation of radical ideas. (Let's allow students to run WAC workshops. Let's get rid of workshops and move to departmental consulting.) The uniqueness of design thinking here is that the administrator is encouraged not to let typical concerns (about budgets, resources, staffing, etc.) get in the way of innovative ideas. Administrators can learn from the prototyping mode that their ideas are doable, and they can begin to problem-solve and diagnose the roadblocks they may encounter along the way, addressing feasibility and viability. From a heuristic point of view, administrators also learn from testing not only through the opportunity to receive feedback on their ideas but by getting the reminder to determine if the ideas actually meet the needs and desires revealed in the empathy phase, as well as if the ideas match the original problem. Prototyping and testing also allow administrators the opportunity to make progress with an idea but to avoid the pitfall of devoting exorbitant amounts of time to a solution that will never come to fruition or that will not bring about change.

As Don Norman notes, people who know a lot about their field tend not to question the fundamentals of their knowledge ("Rethinking Design Thinking"). The goal with design thinking is to allow designers to question their basic assumptions and do so in an informed way led by insights from stakeholders. As writing program administrators, we may not always question the basic fundamentals of composition pedagogy, and in some cases, a particular instructor's context or a particular discipline's conventions may require different ways of thinking about composition pedagogy best practices; design thinking can remind us to question some of our assumptions and redesign programs (or start up programs) with others' values at the forefront.

Of course, there are limitations to the design-thinking process. Perhaps the chief among them is time. It is not easy to find the time to engage in these activities and to find others willing to do so. One important thing to remember is that design thinking is, by nature, collaborative. Maybe directors/coordinators can enlist their on-campus writing committees or devoted instructors in their programs or even students (through an experiential/service-learning type of classroom opportunity) to conduct observations or interviews. Another important thing to remember about design thinking is that it focuses on the users and the unique problem/point of view. As such, as administrators, we should pick and choose which tactics we can employ that are manageable and tailored to the user and problem we are focusing on at the moment, thus narrowing the scope of the work. Another frustration with design thinking is that some of the ideas that generate the most excitement may end up not working once constraints are built back in. However, even implementing small elements of this overall framework into one's approach to WAC program development and sustainability may help foster innovation.

### **Design Thinking as Empowering Mindset**

Readers may wonder if I really needed design thinking to make the changes I have described. For me personally? Yes. For others? Perhaps yes, perhaps no. The question itself harkens back to Don Norman's early critique of design thinking as a "useful myth," when he argues that it is simply what innovators have been doing throughout recorded history. Yet, when Norman doubles back on this critique a few years later, he suggests that design thinking is unique in that it offers a "systematic, practice-defining method of creative innovation" ("Rethinking Design Thinking"). For me, the value of design thinking came from adopting it as a strategic mindset. It empowered me to explore opportunities that I normally would not have given more than a moment's thought. I cannot emphasize enough how getting the provost to make steps forward with the HIP proposal was a huge win in my campus context, and I simply cannot imagine myself having moved forward enough to come up with a viable proposal if I had not been influenced by the creative practices of design thinking. Specifically, taking the extra step to collect strategic data in the empathy phase, and then using those narratives to inform not only my prototype but the actual presentation to the provost, were both extremely helpful. Actually sitting down and "prototyping" my ideas also made a big impact on the process, and frankly, just having a name and strategy for this approach forced me to take the time to engage with some of these activities. As I continue to work with design thinking in the future, one thing I can improve upon is immersing myself, learning how to put myself in the shoes of the faculty with whom I work. I also can see opportunities for more creative prototypes as I take more time



to engage with the process, and I need to work on bringing in collaborators early in the process.

Of course, design thinking is not the only way to approach innovation in WAC, and others may find different approaches more suited to their personalities or goals. However, the systematic, iterative, human-centered, empathy-driven modes of design thinking, I argue, can be usefully applied to a wide range of problems that we may encounter in our programs. Design thinking offers a different way of thinking about and tackling our sometimes “wicked” problems.

## Works Cited

- “An Introduction to Design Thinking: Process Guide.” *d.school*, [dschool-old.stanford.edu/sandbox/groups/designresources/wiki/36873/attachments](https://dschool-old.stanford.edu/sandbox/groups/designresources/wiki/36873/attachments). Accessed 15 April 2018.
- Bazerman, Charles, et al. *Reference Guide to Writing Across the Curriculum*. Parlor Press, 2005.
- Brown, Tim. *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. HarperCollins, 2009.
- Buchanan, Richard. “Wicked Problems in Design Thinking.” *Design Issues*, vol. 8, no. 2, 1992, pp. 5–21.
- Carter, Michael. “A Process for Establishing Outcomes-Based Assessment Plans for Writing and Speaking in the Disciplines.” *Language & Learning Across the Disciplines*, vol. 6, no. 1, 2003, pp. 4–29.
- Cole, Daniel. “What if the Earth is Flat? Working with, Not Against, Faculty Concerns about Grammar in Student Writing.” *The WAC Journal*, vol. 25, fall 2014, pp. 7–35.
- Cox, Michelle, et al. *Sustainable WAC: A Whole Systems Approach to Launching and Sustaining Writing Across the Curriculum Programs*. National Council of Teachers of English, 2018.
- Dam, Rikke, and Teo Siang. “Stage 2 in the Design Thinking Process: Define the Problem and Interpret the Results.” *Interaction Design Foundation*, [interaction-design.org/literature/article/stage-2-in-the-design-thinking-process-define-the-problem-and-interpret-the-results](https://interaction-design.org/literature/article/stage-2-in-the-design-thinking-process-define-the-problem-and-interpret-the-results). Accessed 1 July 2018.
- d.school Hasso Plattner Institute of Design at Stanford. “Design Thinking Bootleg.” *d.school*, [dschool.stanford.edu/resources/design-thinking-bootleg](https://dschool.stanford.edu/resources/design-thinking-bootleg). Accessed May 25, 2018.
- Jones, John Chris. *Design Methods, 2<sup>nd</sup> Edition*. Wiley, 1992.
- Leverenz, Carrie. “Design Thinking and the Wicked Problem of Teaching Writing.” *Computers and Composition*, vol. 33, 2014, pp. 1–12.
- Marback, Richard. “Embracing Wicked Problems: The Turn to Design in Composition Studies.” *College Composition and Communication*, vol. 61, no. 2, 2009, pp. W397–W419.

- Matthews, Judy, and Wrigley, Cara. "Design and Design Thinking in Business and Management Higher Education." *Journal of Learning Design*, vol. 10, no. 1, 2010, pp. 41–54.
- McLeod, Susan and Miraglia, Eric. "Writing Across the Curriculum in a Time of Change." *WAC for the New Millennium: Strategies for Continuing Writing Across the Curriculum Programs*, edited by Susan McLeod et al., National Council of Teachers of English, 2001, pp. 1–27.
- Moggridge, Bill. "Design Thinking: Dear Don . . ." *Core77*, 2 Aug. 2010, core77.com/posts/17042/design-thinking-dear-don-17042. Accessed 12 March 2018.
- Moultrie, James, and Livesey, Finbarr. "International Design Scorecard: Initial Indicators of International Design Capabilities." Institute for Manufacturing, University of Cambridge, [www.naylor-network.com/IDC-nwl/assets/090406int\\_design\\_scoreboard.pdf](http://www.naylor-network.com/IDC-nwl/assets/090406int_design_scoreboard.pdf). Accessed 5 April 2018.
- National Census of Writing. Swarthmore U, [writingcensus.swarthmore.edu/](http://writingcensus.swarthmore.edu/). Accessed 6 June 2018.
- Norman, Don. "Rethinking Design Thinking." *Core77*, 19 Mar. 2009, core77.com/posts/24579/rethinking-design-thinking-24579. Accessed 10 March 2018.
- . "Design Thinking: A Useful Myth." *Core77*, 19 Mar. 2009, core77.com/posts/16790/design-thinking-a-useful-myth-16790. Accessed 10 March 2018.
- Pourdehnad, John et al. "Systems & Design Thinking: A Conceptual Framework for Their Integration." *Organizational Dynamics Working Papers*, vol. 10, 2011, pp. 1–16.
- Purdy, James. "What Can Design Thinking Offer Writing Studies?" *College Composition and Communication*, vol. 65, no. 4, 2014, pp. 612–41.
- Rowe, Peter. *Design Thinking*. MIT Press, 1986.
- Sandler, Karen Wiley. "Starting a WAC Program." *Writing Across the Curriculum: A Guide to Developing Programs*, edited by Susan McLeod and Margot Soven, Sage, 1992/2000, pp. 35–42.
- Shaked, Haim and Chen Schechter. "Seeing Wholes: The Concept of Systems Thinking and its Implementation in School Leadership." *International Review of Education*, vol. 59, no. 6, 2013, pp. 771–91.
- Walvoord, Barbara. "Getting Started." *Writing Across the Curriculum: A Guide to Developing Programs*, edited by Susan McLeod and Margot Soven, Sage, 1992/2000, pp. 9–22.