Introduction
The abstract and description of my sabbatical proposal is as follows:

If I am granted sabbatical leave for the fall semester 2006, I plan to complete a research project entitled *Seeing Writing: Using Technological Metaphors to Reach Engineering Students in First-year Composition*. This project will culminate in a published article in a national peer-reviewed professional journal and a second expanded version with an added historical background that will serve as a chapter in a book-length text about the relationship between cognitive development and social-constructionist theory in the teaching of first-year composition and assessment procedures relative to this theory.

Description
Goals
I will use my sabbatical time to pursue two goals:

1. My primary goal is to research and publish an article that investigates how we might better reach tech-oriented students (engineers, scientists, etc.) through student-centered metaphors and cultural approaches to writing in first-year-composition. This project works toward enabling our students to see and understand writing from a personal perspective, thus allowing them to value and learn the writing process in terms familiar to them

2. My inter-related second goal is to integrate my research and consequent published work into classroom practice using computer-based learning environments like UWP’S *Desire 2 Learn*. I will also create and maintain a website to serve faculty, administrators, and students interested in how this research addresses writing-across-the-curriculum and writing-to-learn pedagogy and, especially, how it can help us to reach our engineering students in writing classrooms

Results
- I have accomplished this project’s primary goal having completed a publishable draft which I have included in its entirety in this report. This article will be
submitted to *The Journal of Teaching Writing* after I have presented my project at the national conference mentioned below.

- I am currently in the process of designing a web-based writing-information and writing-across-the-curriculum cite that I hope will address and aid UWP faculty in writing emphasis concerns in their own classrooms. Although this cite will include my sabbatical research, it will also serve as research and information center for writing-to-learn theory and practice across-the-curriculum. It is my hope that my research and its dissemination will help to reinvigorate UWP’s lost Writing-Across-the-Curriculum and promote a *culture of writing* on our campus.

- During the process of my research, I was invited by the National Conference on College Composition and Communication (CCCC) and the National Council of Teachers of English (NCTE) to present an excerpt of my work at their national convention in New York City (March, 24, 2007). Gaining a chair at this auspicious gathering is difficult and I am honored that they have shown an interest in my work.

- My time away from the classroom has allowed me to both revisit my discipline’s primary texts and to “catch up” on my reading to become more current in my field. This chance to essentially become a student again was professionally refreshing while opening new and exciting doors into my area of interest. One especial current direction is in the field of working class perspectives and pedagogical concerns in the teaching of college level writing to first-generation university students. This area of study is especially important to UWP, given its service area and the number of first-generation freshman we meet every year. Interacting with this academic population addresses directly the concerns of my research.

- Having done a large part of my writing and reading in Edinburgh, I was able to experience some primary historical texts that will allow me to revise and addend my current text to reflect the historical underpinnings relative to my work in cognitive metaphor theory and writing. As well, as per my sabbatical request, I visited areas of professional interest in Great Britain (rhetorical studies, History of the English Language, English literary history) and maintained a photo journal which I am in the process of transferring to a web-based learning environment, e.g., D2L, to augment my lectures.

**Dissemination**

- I have made arrangements with my department chair to offer a presentation on the use of shared metaphor in the first-year composition.
- Based on my research, I have applied for a CIF grant to further apply my work on shared metaphor in a UWP adjunct faculty teaching seminar/workshop program
- I have made arrangements to share my research with the UWP writing center through tutorials and planned discussion groups with regard to reaching tech-oriented composition students.
- I am in the process of offering an excerpt of the final text of *Seeing Writing: Using Technological Metaphors to Reach Engineering Students in First-year Composition* to the online Teaching Excellence journal.
This essay reflects my research and its application to the pertinent questions listed below:

- How can we reach our general-education writing students in the English writing classroom when the majority of them do not see themselves as English students?
- How can we conduct our general education writing courses in such a way as to bridge the very visible gap between our school of engineering and those of us who teach general education writing courses?
- How can we compel our students to value writing enough to take the personal initiative necessary to writing successfully in all genres?

**Seeing Writing: Using Technological Metaphors to Reach Engineering Students in First-Year Composition**

Placing first-year college students, the majority of whom are not liberal arts oriented, into first-year composition (FYC) courses based in a liberal arts environment seems, at best, a hard to manage dichotomy. In general, the problem is terminological, both in the institutional communication of terms and the students’ interpretation of them. Rather than presenting FYC as a cross-disciplinary course in rhetorical skills and practices, FYC is offered through the terministically foggy description of English 101 or English 102 (or any of FYC’s various appellations across the country). That this deeply complex area of study is simply listed in the catalogue under English and is taught by English teachers is one of the primary terministic obstacles both English teachers and first-year college students must negotiate. The vague description all too often depicts FYC as an English course rather than the cross-disciplinary writing course it truly must be seen as.

Essentially, students and teachers need to see FYC through a common lens. Because teachers have a deeper focus and a clearer understanding of FYC’s goals and outcomes, we should work to discover the common metaphors-for-learning our students bring with
them to the classroom and *reinvest* their worldview into teaching strategies that align with their often subliminal preconceptions of writing’s place in their life.

Initially, we can see the problem like this: English teachers (who are all too often specialists in areas other than teaching writing) are thrown in with students who very often have little interest in what they see as just another pesky English class, something to be endured until they can take courses in their major. New to the university, they do not yet recognize FYC’s fundamental value. Because many first-year college students see freshman course work as a direct continuation of their high school education, (footnote on my survey) the term “English” carries a lot of pedagogical baggage not necessarily relative to the goals, expectations, and environment of the college composition classroom. Again, this blurred perception of FYC is deeply problematic. A deeper view of the problem will reveal a confusion of perspectives and terminologies, an unsure environment where specialists are placed outside of their specialty with students who see themselves placed outside of their chosen area of study. Even in the case of rhetoric and composition specialists who are deeply invested in the teaching of writing, the use of exclusivist terminologies and teacher-centered orientations often alienate rather than include students in the dialogue necessary to their success in the writing classroom. It would help, I think, if we began here by identifying FYC primarily as a general education course and branch out from this general definition.

General education is foundational. It serves general students. First-Year-Composition is a general education course. Because the vast majority of first-year writers are not
English majors, we need to see FYC more as a writing-intensive rhetoric course aimed at nurturing responsible critical reading and efficient writing in a sort of “adisciplinary” environment. Ideally, FYC should offer students general rhetorical skills and critical expertise in preparation for the more focused genres of their future advanced college courses and writing in the professions. But the students we meet in FYC are such a chaotic mix of differences and values that it seems near impossible to present course objectives in a standardized package using standardized terminologies. Granted, we all want the same outcomes, but the way in to student learning and perspective is a complex path at best. As teachers of FYC, our audience is simply too varied for us to depend on one tried-and-true classroom approach. Simply put, FYC kids are the university’s new recruits and, in their newness, the least prepared and least standardized group on campus. Even though they might have the same ends in mind, they have little in common with the university’s means to this end; and, within the university’s traditional approaches to teaching college composition, many of our new students fail to find their own traction on the slippery road to academic maturity. The traction metaphor here applies to the active discovery of one’s own values and comprehension of course specific goals and requirements—the discovery of academic and intellectual ownership. Just as we spin our tires in order to melt away the ice and snow between tire and road, our students need to melt away the unfamiliar between self and understanding before they can make a productive connection and move forward. The way to this connection is the discovery of new ways to show course-specific values and requirements, new metaphors for knowing derived from our students’ life experience.
Teaching writing-as-process and the rhetorical stuff relative to this process requires first and foremost our teaching this motley group of new recruits how and why to value writing in order that they see FYC as a valid course of study rather than a simple skills-based training routine. A good way to reach the group as a whole is to help them see their first-year college courses in ways that are meaningful to them, rather than in ways that are meaningful to us. In much the same way that Donald Bartholome sees students’ use of “commonplaces,” i.e., clichés as a means of entry into a new and uncommon world for which they have no official language (592), the discovery and exploitation of common metaphors for writing will help students build a bridge to new and more elaborate ways of seeing and learning writing as a process. Since the new college writer has yet to discover an “official” academic voice, commonplaces, as Bartholome observes, “provide points of reference and a set of “pre-articulated” explanations that are readily available to organize and interpret experience” (592). Working from theories like Kenneth Burke’s terministic screening, Lakoff and Johnson’s cognitive metaphor theory and Lakoff’s framing theory, as well as Mary Louise Pratt’s *contact zone*, in the FYC classroom, we can discover a means to bring into practice a certain cross-curricular as well as cross-cultural comprehension of writing that goes beyond the often stultifying perspective offered by commercial textbooks. In order to actually bring writing and the learning it generates to every student, we need to let go of (or loosen) traditional perspectives and allow ourselves to see the world through our students’ eyes and work to relate our teaching goals to their terministic predispositions toward learning and how this learning might better occur.
In an attempt to help students connect the abstract ideals of FYC with concrete experience, Lad Tobin notes that, “Since our composing processes and accompanying attitudes are abstract, idiosyncratic, and largely unconscious, we need to find a shared language or images to which we can respond” (446). Noting that metaphor’s true power lies not so much in the representation of meaning as in its ability to make meaning, Tobin notes Ann Berthoff’s observation that metaphors “not only help us establish relationships between ideas but that they also help us acquire those ideas in the first place” (447). Essentially, the referential quality of metaphor allows us to relate to the newness of a situation in terms of our own previous experience. Tobin cites Lakoff and Johnson and a cadre of other researchers in his observation that “Metaphor . . . is a stage, perhaps a necessary one, that we use while learning something new” (447). While Tobin’s own application of metaphor in the writing class requires students to develop (or discover) their own entry-level metaphors “that further the conception of composing for the discourse community and for the individual writer” (451) we might do well to take a deeper cultural look into how our students perceive and value the learning process and, from a more focused perspective, their understanding of why and how writing can actually work for them. Inasmuch as the metaphor-search exercise can be a positive learning experience (an exercise I’m sure many of us use in our own writing assignments), a lot of times students will see this as a sort of creative challenge and will come up with generally inefficient “metaphors” that they will then defend simply because their draft is finished and the assignment has been honored. Thus, the develop-a-metaphor assignment, though offering students a positive opportunity to dialogue about writing, to discuss writing, to see writing from various attitudes, and to engage in the
actual act of writing, does not really get down to the actual ontological and generally
subliminal metaphors that are foundational to our students’ perception of and attitude
toward general education writing requirements in their first years in the university.
Discovering the basic shared deep metaphors for learning and especially for writing will
allow us to enter the writing classroom with more confident and efficient ways to both
see and show writing to this group who is so obviously new to the university learning
environment.

**The Technological Turn**

At my small university branch, the majority of first-year students are male engineering
majors. Yet, when I ask many of them what sort of engineer they want to be, they often
can’t tell me. Rather, they say that that they are interested in math and science – that they
did pretty well in high school – and that the vague choice of an engineering major was
pretty much the only option they had upon entering our general admissions university. I
might add, as well, that because almost all of them fear the liberal arts, read little, and
write less, the generally undecided will simply sign up at the tech building and hope that
something clicks for them in the near future. There are enough of these students in our
general education program to constitute a type, a type that might be at risk, if we can’t
reach them before they become frustrated and leave. Understanding our students’
specific cognitive views of academia can help us discover teaching patterns relative to the
way our students see the world. In a world that overtly values math and science over the
liberal arts, very many students, regardless of their major, come to the university with
deeply set technological perspectives. They come to us with the idea that all effort must
have an objective purpose and a relative “payoff,” that all work must produce a viable, useful product. There is a sense of the physical in their expectations of the academy. Discovering a way into their learning process will require an understanding of the values and culturally generated notions they have brought with them into the university. Understanding how to discover productive metaphors for learning based on these unique social and cultural perspectives would allow us to help students discover what Philip Eubanks refers to as rhetorically logical metaphors for learning, that is metaphors based upon the students’ “own social, cultural knowledge” (109). This move toward rhetorically logical metaphors – for both students and teachers -- is the first step in bringing our FYC students into the ability to realize and use their own metaphors for learning – in this particular case learning not only how to write, but how to value writing as well.

The social and cultural knowledge base relative to my students’ technological view of education lies in the fact that most high school graduates from our service area come from a hands-on, get-results, rural or small town life style. This single-minded pre-college world view values industry, tried-and-true formulae, and a secure mechanical career over the less physical, intangible world of the liberal arts and thus lacks the desire and understanding necessary to the joining of the two into the whole education a university must offer. Simply (and perhaps brutally) put, this group comes from working class households that have little to do with intellectualism or reading and from families who see college as a means only to good job. I am, of course, not indicting this group; but in realistically recognizing the situation, we can help move these students beyond
their perfunctory “get-r-done” attitude and assist them in attaining the intellectual foundation necessary to actually completing their degree. Thus, a lot of our “engineer” majors are not so much future engineers as they are just regular kids who feel the need to go to college and who understand the world from the perspective of a hands-on, workingman’s environment. Others, of course, are invested in a technological career and the academy-at-large; but in either case, the liberal arts is pretty much avoided beyond the mandatory general education requirements.

Because our tech-oriented students share a general interest in how things work and the structural hierarchies and formulae of tangible and provable working models from design to final product, writing teachers can help them access writing and discover general rhetorical skills by encouraging them to see writing using familiar and understandable models and examples from deep within their personal history. Comfortable metaphors-for-writing can act as “a way in” for tech-oriented students and their teachers more readily than traditional textbooks that insist students see writing from the text’s perspective. Yet these metaphors must be valid. Tobin notes the problem of trying to control the students’ metaphor selection, noting that, “. . . teachers offer their own metaphors for composing as if they were inherently true . . .” (451) which, all too often, suggests to students that there are correct and incorrect metaphors for writing when, in fact, we must see these metaphors as more or less sincere and efficient. Thus, rather than suggesting or forcing our own metaphors on our students, it would make sense to try to discover the basic foundations of their perspective on learning and attempt to begin the teaching process from within their terministic territory. Recognizing the technical
perspective, visual metaphors, and the schema they bring to the classroom, teachers can lead tech-oriented students to a successful first-year composition experience through non-traditional cognitive windows relative to the learners’ unique terministic position and general worldview.

**Resisting Resistance**

The technological metaphor approach addresses two related pedagogical concerns: dialogic classrooms, and the application of the epistemological metaphors discovered in these classrooms. We can see in this dual approach in Paulo Freire’s concept of liberatory education and Kenneth Burke’s rhetoric of identity and terministic screen theory working as a team to bring students to course material more so than bringing course material to students. Freire’s liberatory education finds its purpose in its “drive towards the reconciliation” of the student/teacher dichotomy so that “both are simultaneously teachers and students” (57). This merging of the traditional dyad opens an opportunity for teachers to see new ways to marry course-specific goals with student-specific values. As well, it allows students a chance to discover for themselves that shared metaphor works both ways, that, perhaps, if they move a bit toward academic perspectives, a productive meeting-in-the-middle can produce the shared identity of learner/teacher. As well, a receptive teacher will discover that course-specific goals can be reached through the multivarious avenues these new metaphors will open. This shared identity addresses Eubank’s rhetorical logic and Burke’s view of true rhetoric as one of identity, a successful and productive dialogic space that can only occur through the consubstantiation of both sides’ terms, views, and values (A Rhetoric 25). Burke’s
consubstantiation, for the purpose of this essay, can be seen as the dialogic action necessary to a mutual teaching/learning environment. Here, the action of dialogue works at various and simultaneous levels and can refer to the active movement of both sides toward a consubstantial middle ground as well as the positioning and re-positioning necessary to a tenuous balance of the trust and mutual understanding necessary to both teaching and learning. Shared metaphor addresses, as well, Burke’s theory of the terministic screen, the unique position from which one views and thus values an experience (Language 44-62). This viewing and valuing occurs in the viewer’s naming-into-existence the experience in familiar (and therefore trusted) terminology.

Pedagogically, if a teacher can discover her students’ terministic screen and reposition herself to view the phenomenological thing from the same attitude while maintaining her original goals and agendas, she will be better able to join with her students in the learning process. If we desire our students to change, we must be willing to change too.

Bringing students to their own learning can circumvent the problem of resistant learners because once students are able to see the course material from their own perspective—and understand that the teacher can see it in this way as well—they will often, in the process, gain the sense of ownership so necessary to academic progress and maintenance. From this perspective of ownership comes an intimacy that allows them to see the learning and goals that they previously would have resisted had the teacher forced uncomfortable ways of seeing upon them. Thus, it may well be that what resistant learners really resist is the package more than its content. Seeing teaching as an exercise in rhetoric, we often discover that success depends on the way we show our content to an
audience who has little in common with our own scholarly perspective on writing. Too often we simply expect that a major part of our teaching and our students’ learning processes involve their seeing course-goals exactly the way we see them because it works for us, that our way in is better than our students’ way in. Hence, resistant learners might not be resistant learners at all; rather they resist the ways of seeing that are often forced on them by teachers who maintain a rigid standard of values and perspectival application.

Discovering our students’ deeply seated metaphors for learning compels us to help students as well as ourselves to meet within a shared language that might, as Lad Tobin observes, “provide shared access” by dislocating both sides from the writing scene and the academic jargon associated with it so that writers can “talk candidly about writing” (446). The concept of a shared language is key here. The way in is not the exclusive path for students or for teachers. It must be a shared path – one that both parties can blaze together. The writing teacher must strive to understand the students’ framing process as much as she might hope the students might work to understand her own. Although Tobin calls for students to discover and refine their own metaphors for writing, many students need a starting place, a position from which they can progress. Rather than leading our students into their own world through metaphors developed from our own perspective, Tobin notes that it is the teacher’s job to help students develop their own metaphors for writing “that further the conception of composing for the discourse community and for the individual writer” (451). The relationship between writer and reader, writer and text, begins the complex process of metaphorical relationships between
the writing process and the infinite number of terministic perspectives that serve to define one conceptual domain in reference to another structure. It is here that the real challenge begins. How do we, as teachers, discover the basic cognitive foundations relative to our students’ understanding of written communication? As Tobin has discovered, productive entry-level metaphors will allow students to build more complex and efficient personal metaphors as their original conceptions are challenged and their writing becomes more “complex and flexible” (452). Yet, as Eubanks notes, these introductory metaphors must have a certain “rhetorical logic”. Noting that “most of our reasoning, perhaps all of it, is biased by social and cultural knowledge,” Eubanks sees the essence of an effective metaphor in our “[dependence] on social, cultural, knowledge to guide our inferences” (109). Hence, an understanding of our students’ life outside of the academy – their cultural home base – is necessary in the search for a rhetorically logical point of reference.

Asking students to develop their own metaphors for writing is a productive exercise on many levels, but it is especially valuable with regard to their ability to cognitively map their own writing experience. Placing the often alien experience of writing within the more familiar realms of personal experience will certainly bring them closer to a more personal understanding of the writing process and allow them the sense of ownership and confidence necessary to feel in control of the situation. Yet, this sort of metaphor exercise runs the risk of artificiality that can be offset by our own attempts to understand our young writers’ unique terministic screens or, in George Lakoff’s terminology, the frames through which they view and define their immediate experience (see Moral
Politics). Once we can see writing and learning through these frames along with them (imagine looking over their shoulder), we can help our students into more productive metaphorical touchstones, foundations upon which they can build deeper, more personal metaphors for writing. In this way, they come to understand what we want them to understand on their own terms.

Lakoff’s concept of frames is deeply related to Burke’s theory of terministic screens. Yet, while Burke’s terminism is founded on the attitude or place from which one views the pre-existent thing, Lakoff’s framing takes on even deeper cultural/environmental undertones. Whereas Burke’s terministic screen theory is based essentially on the naming process and the sorting out of truth values by accepting one relativistic stance at the cost of all others,

“Even if any given terminology is a reflection of reality, by its very nature as a terminology it must be a selection of reality; and to this extent it must function also as a deflection of reality.” (Language 45)

Frame theory addresses what Lakoff refers to as the “cognitive unconscious,” the basic set of schema that direct us to our terministic evaluation and naming of experience.

“Frames are mental structures that shape the way we see the world…. You can’t see or hear frames. They are part of what cognitive scientists call the ‘cognitive unconscious’…All words are defined relative to conceptual frames. When you hear a word, its frame (or collection of frames) is activated in your brain.” (Lakoff Don’t xv)
From Lakoff’s perspective, the naming of a thing depends not upon what it is, but in how certain groups place truth-value upon both physical and abstract situations. An understanding of frames allows us to observe how these truth-values can “morph” through a relative dialectic dependent upon each group’s cultural history. Note, for example, Lakoff’s discussion of the word “father” (framing): The name/term father has basic implications. We all understand what the utterance implies and this is what gives the term its power. Yet, the frame through which this term is seen directs/diverts the power into areas of cultural and ideological expectations, i.e., the strict father v the nurturant father. The critical element here is authority. Lakoff’s strict v nurturant dichotomy is based on how each group’s frame uses the term for its own self-empowerment. Framing finds its basis in this very human activity. We use language for self-empowerment. Thus, being able to understand how certain groups see and negotiate the world through language (both consciously and unconsciously) will allow us, as teachers, to either help or hinder our students’ hold on power. While Lakoff’s aim is to re-frame our cultural-political power base, as teachers of writing, we can use the same rhetorical concept to empower our first-year composition students by helping them discover their extant frames for writing and show them how to build on this new self-knowledge.

Being able to see the writing process through our students’ eyes then does not require us to ask them for their own creative metaphors. Rather, it requires that we are able to discover and understand the deep seated frame through which they see and apply their cognitive unconscious predispositions to their own learning process – The unconscious
quality of these predispositions is an important factor, because if we can discover, if only partially, their window upon the world and help them to stand back and see how and why they perceive it the way they do, they will be able to build truly productive and sincere metaphors for writing and learning in general. Based upon the confidence and power of owning a personal stake in their own academic success, these are important metaphors that will remain with them well beyond their short stay in the university.

In order to achieve Tobin’s ultimate goal of academic growth through applied metaphor, a lot of new college students simply need to be pushed a bit in a direction that they can relate to and then be allowed the freedom to take it form there. The ultimate frame must be one of logical application. The student must see the process in ways that are personally meaningful and useful. Mary Louise Pratt addresses this situation nicely in an anecdote about how her son came to value academic knowledge from within the contact zone of his baseball card collection. When he discovered that his baseball card collection had value, he was required to apply math and organizational skills (part of his problematic high school curriculum) in order to maintain the value and his place in the community of collectors he wished to join. School work suddenly had practical applications. His primary non-academic interest presented new and interesting opportunities to further his general knowledge, much of it academic, in accord with personal values and ownership (33-34). From this anecdote we can see his interest in baseball cards as his window to the world, a primary terministic perspective that begins a life-long dialectic of knowing anchored in personal concerns and interests, a place from which to start. Paulo Freire’s liberatory classroom and Kenneth Burke’s terministic
screen theory and rhetoric of identity inform Pratt’s concept of the contact zone when we realize that shared terminologies (metaphors) will allow for the consubstantial network necessary to a teacher/student dialogue as well as offering a comfortable “home base” from which future learning excursions can depart from and return to. To sum up this idea of shared terminology and identification, we might consider Lakoff and Johnson’s view of metaphor as negotiated meaning, a means by which humans come to terms with their experience in the world. Seeing metaphor as playing a part in “what is real for us in our culture” (147), the authors drive their point home succinctly:

When the chips are down, meaning is negotiated: you slowly figure out what you have in common, what it is safe to talk about, how you can communicate unshared experience or create a shared vision. With enough flexibility in bending your world view and with luck and skill and charity, you may achieve some mutual understanding. (231-32)

This sense of “achieving mutual understanding” addresses not only Tobin’s observation that our students must discover personal metaphors for writing; it maintains as well that teachers need to have some metaphorical touchstones regarding their own place in the student/teacher dialogue. The concept of a shared metaphor cuts in both directions Discovering in our classrooms a common metaphor or terministic screen, we can create and maintain a contact zone where further rhetorical/metaphorical meaning can be negotiated. From this shared attitude, we can see the same metaphor for learning used as a metaphor for teaching as well. Both students and teacher can progress together in essentially the same metaphorical vehicle. Shared metaphors round out a sort of visual rhetoric whereby our students can better see what it is we want them to see, lean what we
want them to learn and perform in ways we wish them to perform, by encouraging them to see our goals from their own home turf.

**Teacher perspective**

The ability to see situations from various perspectives works for teachers as well as students. In my own school, I’ve had to see my first-year composition courses for what they truly are: writing courses offered, primarily, to tech-oriented students. 48% of my university’s student body consists of tech-oriented students and an even higher percentage of incoming first-year students are “engineering majors.” Hence when I look out into the classroom, I need to see a group who most likely sees the world through a practical, often mathematical, nut-and-bolts lens; thus, it would seem that approaching my own course goals from a tech-perspective rather than from a traditional English teacher perspective, might allow us both to sort of meet in the middle to discuss writing for what it is in terms the students will best comprehend (and respect). But, even if we know our first-year students’ ultimate goals, it’s important not to direct ways of writing to their major-specific formats – not yet. Because FYC is a foundational course, we can’t put it in a WID (writing-in-the-disciplines) framework. Teaching people who are not yet vested in their tech-majors how to “write like engineers” would be reductive. To use a tech metaphor: new college writers need to know the tool box before they start working on the complex machinery of their chosen major. In this case, I need to see my work as “teaching kids who want to be engineers how to write well in general so they can move comfortably and confidently in and out of their particular genres when the time comes.” Yet these students are, in their hearts, the technologists they want to become. It is a point
of identity they bring with them to the first-year composition course and it must be
recognized if we want to validate writing and have the students choose to include writing
in their set of academic values. Since teaching itself is a rhetorical act, finding the
common ground in a persuasive situation (the point of persuasion in this case being that
writing is a necessary tool for learning as well as professional communication) is
essential to the dialogue between teacher and student. In the final analysis, this positive
dialogue will achieve Freire’s goal that we all become learners in a progressive, dialogic
classroom. Allowing myself to see the writing process through a neophyte engineer’s
eyes will allow me to guide him or her through the rigors of FYC in the most comfortable
and productive way possible.

**Student perspective**

Tech-oriented students in first-year-composition can understand writing more easily if we
allow/encourage these students to see and enter the writing process from a more personal
perspective rather than insisting that they see writing from a traditional English-oriented
perspective. The idea of composing community and, in the process, composing a
learning environment comes of student/teacher dialogue which, itself, derives from a
capacity to discover and use the tech-students’ shared metaphors for learning and writing.
Because our engineering students share a general interest in how things work and the
structural hierarchies and formulae of tangible and provable working models from design
to final product, we can help them access writing and rhetorical skills by encouraging
them to see writing as an act relative to their own interests. And it is from this initial
rhetoric of identification that our first-year students can discover the cross-disciplinary
nature of a university education, that the ability to manipulate one’s terministic screens relative to context is one of the greatest lessons learned in a university gen-ed program.

Metaphors that bring together diverse conceptual relationships like writing process-as-calculus, text-as-schematic, text-as-machine, allow engineering students to actually see the writing process as an exercise in the design, generation, and control of the development and currency of ideas, an exercise that relates language’s symbolic action to the tangible action of technical design. This way to see writing and rhetorical strategies metaphorically offers tech-oriented students a new perspective on writing that both teaches and reinforces the rhetorical concept of purpose and audience and the profound realization that a text, like a finished engineering project, must actually do something relative to the expectations of a pre-perceived project and the group it will serve. The way in to an efficient learning environment is often lit by our students, and it would help us to view the world through our students’ eyes and act on the metaphors they, as a community, bring to our teaching. Being able to understand their own shared cognitive metaphors and cultural value systems will allow us to design classroom procedures relative to these values, thus allowing us to better deliver the necessary course-goals in a much more acceptable and understandable package. As Ann Berthoff has observed: How we see language is how we will teach it (42). To further this observation we might add: How our students see language is how they will learn it.
Two Cognitive Metaphors Strategies for Tech-Oriented Students

Writing Process as Calculus

Introducing a writing-as-calculus metaphor to tech-oriented students in the FYC classroom allows them to see the writing process through a contextual mathematical lens, to be able to conflate literacy with numeracy and, finally, to see writing in terms of another more identifiable process. A teacher’s ability to use the students’ own orientation as a bridge into a more abstract understanding of the rhetorical process clears the way to more efficient learning. When writing becomes, for them, calculus (rather than overtly formulaic), our young writers will come to address the relative metaphors that come with the primary merger. Calculus, for example, is a study in probability factors and ratiocination relative to context. It is a mathematical process that recognizes the always already existence of probable “answers” while working toward a final set of the most efficient possibilities relative to a specific purpose. The best “answer” to a real-world design-related problem, for example, can never be clear until we can see the problem in context, e.g., What is the project’s purpose? Who will benefit? What are the variables relative to most efficiently achieving the situation’s requirements?

Context, along with all its recognizable variables, is a crucial part of the calculus equation. In classroom discussion, I might ask the class, “What is the most efficient path between points A, B, and C in a given situation.” The most common answer is, “a straight line.” Of course, this answer can’t be “correct,” because the qualifier “in a given situation” has not been addressed. Until we know the situation, we cannot responsibly decide what is efficient and what is not. Further discussion, then, will address the
situation. From here we might discover or create a situation and address it, or we might discuss the relevance of the word, “situation,” defining it in terms of:

- **Purpose** -- why the action is occurring,
- **Audience** -- to whom the purpose might be directed,
- **Thesis** -- why and how the terms of efficiency might be met.

After students are able to determine and define their own unique situation for writing, we can further discuss how writing’s rhetorical situation in many ways parallels the mathematical situation. From this point we, as a class, will have discovered a new way to see and to talk/write about the writing process as an exercise in probability, as a conscious act of factoring out the least efficient means to a text’s purpose in favor of a subset of more efficient rhetorical approaches, styles, genres, usage. Because there are innumerable ways to use language to get something done, students soon realize that from this chaos of possibilities, some choices are better than others. To discover the “best” choice they must have a sound understanding of what they want their finished text to do, who it will do for, why it is important to do and, specifically, why it is profoundly important to themselves, as the designer of their text, to succeed. From this point we can proceed to the drafting process which will, by then, have become a self-directed exercise within the parameters of a well defined rhetorical situation that sees process as a means to a responsible finished product in a world that thrives on production.

Metaphorically, then, asking FYC students to discuss “the best way to get a point across,” is an exercise in calculus, in developing a productive terminology founded in contextual
understanding. The process involves everything from the application of the already known to experimentation with probable strategies and techniques. But none of these actions represent a complete process unless there is a sense of purpose, an understanding of the value of both the finished product and the process by which it is born. For the young engineer, purpose and outcome are the reasons for work. Mathematical processes, they have discovered, are productive; mathematical processes work toward answers, toward completed formulaic procedures that will do something in the world. The successful connection of this outcomes-oriented process with the writing process—which does the same thing linguistically—strengthens through dialogue both the numerate and the literate in FYC courses to achieve Burke’s ever-important consubstantiation. It is important to note consubstantiation’s deep relation to metaphor’s dialogic structure when we see it as the coming together of two seemingly disparate entities into a mutually advantageous dialogue to generate new and mutually acceptable contexts. Metaphorical seeing strengthens, as well, the upper-level language abilities many of our incoming students seem to lack. Noting that getting one’s point across might require a well designed metaphorical bridge of language compels students to see that there are indeed better bridge-building strategies than others and that, with practice, study, and understanding one can consciously become a better writer in the same way that one can become a better technician or engineer. And that, in many ways, the processes are very much alike.
To summarize, a calculaic view of writing can address:

- **Process:** All texts are the product of a series of activities that address both previous actions and anticipate the “next step” from invention through final revision according to context.

- **Context:** All meaning occurs within a rhetorical situation. Writing does little unless it occurs in context; unless it is situated; unless it has purpose.

- **Purpose:** All action comes of purpose. Understanding one’s purpose is necessary to well-developed, efficient expression and audience appeal. Without purpose an engineer or writer is deprived of the privilege of choice.

- **Audience:** Audience and purpose are two necessary parts of a much larger whole. The symbiotic nature of the audience/purpose team builds context—writing’s purpose is to serve audience; audience’s purpose is to validate writing. (Even if the audience is the writer herself.)

- **Drafting:** Like calculus, writing is an exercise in probability and selection relative to context. Solutions derive from the always already that pre-exists each problem. Continuous drafting will help not only the text/product, it will help the writer better understand how to negotiate textuality.

- **The re-stage — Revision strategies and techniques:** Inasmuch as drafting can be seen as a generative process, revision, from a calculaic perspective, is the revisiting of an adequately generated present-text for the purpose of [re]generating through reviewing, reselecting, rewriting and fine tuning a purposeful next-text relative to the writer’s deep understanding of contextual requirements. I note here that this deeper understanding occurs in process. Thus,
what might have been considered the aim of a final draft before deep revision
might require an incremental re-working relative to what the writer has learned
during the “re- stage”.

In the final analysis, a writing-as-calculus metaphor, can help to activate FYC students
whose terministic predispositions often turn them into resistant writers. The comfortable
non-writing metaphor allows a contact zone where first-year college students might
become less anxious with regard to writing in general. Allowing them to place a user-
friendly template on an all-too-often hostile experience will help our young engineers to
create their own metaphors for writing as they progress through the academy and into
their profession. Albeit, while the instructor’s suggestion that writing is like calculus
begins the process, it is certainly the students who create, for themselves, a final personal
metaphor. How powerful this metaphor exists in each student is, of course, variable, but
in most cases, the terministic ice will have been broken and students will learn to see
other previously questionable experiences through a more personal and comfy
metaphorical lens. In this sense, FYC can teach students how terministic screens and
application of personal metaphor can help situate an experience to their advantage, a
rhetorical skill valuable across-the –curriculum as well as in the professional world.

**Text as Schematic**

If a writing-as-calculus metaphor demonstrates how a writer must discover which sort of
writing will best succeed according to context, an essay-as-schematic metaphor shows the
context as a mapping out of current manipulation and synergistic design. Like Burke’s
Pentad, the schematic-metaphor seems best applied toward the analysis of a product/draft rather than as a means to begin the process. Thus, the schematic approach might work well in a revision workshop. Being able to see and understand an existing text as a picture or map of a successful application of form and style to purpose further allows students to understand a rhetorically successful product as the writer’s ability to control the flow and current of language so that it most efficiently achieves its ultimate purpose, its symbolic action. Metaphorically a schematic represents a sort of rhetoric of current manipulation. Each electronic device, from boom boxes to television sets has its own purpose and thus its own schematic. One schematic simply will not do two different jobs. Although each device thrives on the same general energy, the schematic aligns with a particular purpose in order to direct the pre-existent current/flow in ways specific to what the designer wants the product to do. Hence, the flow of current within each device will be channeled through resistance and capacitance, will be split, transformed, directed and redirected to maintain a sort of synergistic chain of events designed to meet the expectations of both the designer and the consumer – of writer and audience.

Writing teachers can play off the branch metaphors inherent in the essay-as-schematic model when discussing the writing process.

- **Invention:** When addressing invention, students can be asked to discuss what exactly their purpose might be, i.e., what specific action will they want their product to do. Understanding language as symbolic action helps students to understand how this action can be channeled and manipulated to generate social action, political action or even physical action, especially if the ebb and flow of
rhetoric, style, grammar, and mechanics work together efficiently within the parameters of the project’s well defined purpose.

- **Drafting:** The drafting process relates well to technology’s well known “drawing board” (the one we are so often compelled to “go back” to). It is here that students can discover through trial and error the success ratios of various combinations of rhetorical and grammatical choices. At this stage, metaphors of resistance and capacitance can be helpful in the analysis of existing drafts. Stylistically, resistance can relate to the control of information flow, choices between long or short introductions, foreshadowing, thesis placement and development. The resistance metaphor addresses paragraph structure, the deductive move from a topic sentence’s general claim toward its more specific qualification through illustration and example until the paragraph’s purpose is fulfilled. A capacitance metaphor works with paragraph structure as well, inasmuch as a paragraph must “fill up” efficiently before the next relative idea can spill over into a new paragraph via a well-designed transition sentence that will connect with the next circuit (paragraph) where the same resistance/capacitance procedure will be repeated. Capacitance can address foreshadowing and peripeteia in expository and narrative texts too.

- **Revision:** The revision process asks the designers to do a “test run” to see if their “circuitry” is designed well enough to achieve its purpose. Collaborative peer groups and teacher conferencing become test-groups who will note strengths and
weaknesses and recommend changes with regard to the efficient achievement of the designer’s purpose. Then, it’s “back to the drawing board” for some re-tuning relative to “test-group” recommendations and the designer’s own new understanding of purpose and audience. Revision here often addresses the fine-tuning of transitions, the cleaning or replacing of “contact points” that allow the efficient flow of energy from one part of the product to the next. Revision also addresses the reader/consumer inasmuch as the final say in a product’s success lies with those who will use it. Until the designer understands to whom his product is offered, he will be hard pressed to make the right decisions regarding its final presentation. From a techno product orientation, audience consideration can be seen as a sort of study in demographics and market management – two perspectives that relate well to the schematic design metaphor.

- Editing: Because, as Tim Crusius observes, process’s bottom line is to create a well received product in a product-oriented world (115), editing becomes the designer’s final touch. Even if the product’s concepts are appropriate and the idea is well founded, if it is not presented in the proper format, the whole thing might not work as the designer intended when it “hits the market.” Terms must be presented in conventional format, usage and mechanics must be in the proper shape, the product must, in fact, look like what it purports itself to be. Editing addresses the fact that a schematic or a piece of writing must follow the set of shared rules all readers/consumers have agreed upon as appropriate.
Conclusion

The two examples above are certainly not the only ways in available to those who would discover and apply technological metaphors in the writing classroom. There are as many perspectives as there are students, and it is important to understand both individual and group frames relative to an institution’s service area. For example, the approaches offered here might work as well in a more cosmopolitan university environment. Rather, these examples serve to show how we can bring our new-to-college students to writing in terms they understand or, at least, respect. To see writing-as-a-machine, for example, allows tech-oriented students a deeper perspective on writing relative to the combinatory nature of a well-tuned machine’s parts, the transition of power between gears and the ratiocination of power those gears produce. Seeing writing through a machine metaphor can bring to our students a sort of rhetoric-of-mechanics that better helps them to comprehend the writing process. From this point, this contact zone, students can eventually progress beyond the homey perspectives they bring to FYC toward writing’s more academically mature abstract and intellectual attitudes.

Beyond the purely techno-orientations listed here, we can see how any metaphor with an inner integrity can work as a learning/teaching metaphor. Music, for example, with its reigning sub-metaphors of harmony, rhythm, style, purpose, emotion, culturicity . . . , is a very effective template to place over the rhetorical process which, while working well in the teaching of writing, can proceed to even further depths as a way to understand symbolic action and language as a cultural tool – two ideas that are not too complicated for, say, a second semester FYC course in directed research. When students can see and
relate to the abstract qualities of the writing process, when they can make them tangible, they will be able to see, in many cases, a bit of the theory behind it, i.e., why and how FYC can work for them. This seeing is, in my estimation, a much better way to show FYC’s value than simply saying “trust me, I’m an English teacher.”

In any case, a primary benefit of the metaphorical approach is its link to rhetorical theory in general. Because so many of our general education students are disinclined toward English courses while maintaining a youthful curiosity in general, the techno-based metaphor can be successful inasmuch as it works to show what makes writing “tick.” When curiosity is aroused to the point of experimentation and discovery, writing does, indeed, become another thing, a comfortable thing to be poked, pinched, and played with. It can become your father’s old watch or a box of Leggos. In many classrooms where writing is just “taught” as a means to an end, a way to communicate while maintaining conventional style and usage, students build their own new metaphors for writing relative to their immediate experience. And this is not always good. In a “current-traditional” classroom these new metaphors can work to the detriment of sound processual skills due to product-biased orientations. Metaphors like writing-as-my-job or writing-as-a-hurdle, or even writing-as-a-way-to-please-authority are all useless to the dialogic learning process. If we, as teachers, don’t help our new college students toward new and more productive ways of seeing, they will develop their own ways because the gap exists and will surely be filled one way or another. Understanding that different interests foster different ways of seeing and comprehending the world will allow us, as teachers, to maintain a deeper classroom dialogue that will help tech-students discover what it is we
want them to know on their own terms. The “way in” is often lit by our students, and it would help all concerned if we were to view the world through our students’ eyes and act on the metaphors they, as a community, bring to our teaching.

Works Cited


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