TEXT
Journal of writing and writing courses

ISSN: 1327-9556 | https://textjournal.scholasticahq.com/

Penn State University, Berks College

Sandy Feinstein, Bryan Shawn Wang, Nicolas Fay, Nathan Tam, Nicollas Bernhart, Kyla Ebersole

Admissions: A report from a pilgrimage to an alternative university

Abstract:
"Admissions" is a speculative fiction invoking two traditions – science and literature – that reflects on creativity in education. The overarching frame is that of a science report and the literary construct is a pilgrimage, very loosely modelled on the work of Geoffrey Chaucer, as well as on the tales of imagined travel by Sir Francis Bacon *(New Atlantis)* and Margaret Cavendish, Duchess of Newcastle *(The Blazing World)*. The intent is partly to evoke the critical power in creative work that simultaneously engages the inherent criticality of creative expression across disciplines. More specifically, each voice offers a different "plane" of creativity and learning that together intersect and combine to make a more complete education.

Biographical notes:
Sandy Feinstein, Professor of English and Honors Program Coordinator, has published on alchemy and biology in Chaucer and chemistry in Cavendish as well as on the teaching of literature and writing. Her poetry appears most recently in *Willows Wept* and *Pivot* (2023), her fiction in *Flash Fiction* and *The Mythic Circle* (2023). She and Bryan Shawn Wang have together published creative nonfiction and creative scholarship in *Science-Based Vulnerability: Scientists and Poets #RESIST*; *CEA: the Critic*; *Angles: New Perspectives on the Anglo-phone World* and *Pedagogy*.

Bryan Shawn Wang, Teaching Professor of Biology at Penn State Berks, has published, in addition to reports of his scientific research, fiction in literary magazines including *Washington Square Review*, *Valparaiso Fiction Review* and *Kenyon Review Online* and, with Sandy Feinstein and others, articles on interdisciplinary thinking and teaching in the college classroom and beyond in *Comparative Media Arts Journal*, *Scholarship and Practice of Undergraduate Research* and *Journal of Sustainability Education*.

Nicolas Fay, a recent Penn State graduate in Writing and Digital Media, is presently in Turkey on a Fulbright Award. His work has appeared in Wang and Feinstein's article in *SPUR* and has been accepted for publication in *Passionate Humanities.*

Nathan Tam is a sophomore majoring in Biochemistry with a minor in Mathematics. In addition to presenting his research at national American Chemical Society conferences, he has also published original orchestrations in *KLIO*, Penn State's creative arts journal. A pianist, violinist and violist, he has performed with the Reading Symphony Orchestra and won numerous awards and competitions.

Nicollas Bernhart is a recent graduate from Penn State with a degree in accounting. He is currently working full time as a cost analyst for a manufacturing company while pursuing a graduate degree in finance. His goal is to start his own company and become a director. His ultimate goal is to make a movie.

Kyla Ebersole, a sophomore majoring in biology, has presented her research at the national Waterbird Society Annual Meeting, where she was awarded the best student poster award. Her artwork has been exhibited and placed highly in the "Nature of Nolde Forest" art contest and the Berks County Conservation District's "Paint the Rain" competition.

Keywords:
creativity, education, critique, interdisciplinarity

Introduction

Ever since tenth grade when I (Sandy) submitted a short story instead of the assigned essay in English, I have understood with ever increasing clarity that I did so as a means of trying to understand what I don't understand.

What I have always liked about literature is what's unexplained. As a student, I figured stuff out by "re-mediating" what I read, a term defined as "the representation of one medium in another" (Bolter and Grusin, 1996, p. 338).

At university, I asked permission to write fiction or poetry as a substitute for all sorts of assignments, including analytical research papers. I was working toward a "creative" form of close reading that, when necessary, included research, though embedded and integrated rather than explicitly cited. I sought permission from teachers to respond "creatively", promising to cover the ideas, or themes, or whatever the assignment asked; perhaps because it was the early seventies or the kind of educational institutions I attended, no one objected, not even science teachers.

At the large and small institutions of higher education where I have taught since 1980, I have regularly assigned experimental or "creative" projects. Immediate reactions from students have always varied: relief, anxiety, fear. How would they do it? They weren't creative, some claimed. But then, as now, students have responded in striking ways, no matter how confused they insist they are. Developing creative assignments and seeing the responses to them became opportunities for discovery – for me as much as for them.

The difference was not only in assessment vehicles, but in what we did in class as well, which I hoped would open new ways of seeing challenging literature while getting students more interested in it. In the mid-90s, for example, I structured a class in Gothic literature as a field course that included dissections and specimen preparation with biologists; in another, co-taught with a chemist, laboratory experiments were devised. These kinds of courses were a form of creative thinking and writing, with the purpose of helping students understand literature by shaking it free of familiar delivery systems, whether lecture or discussion, scholarly articles or textbook introductions.

Teaching, like literature, resists a vacuum; it is dynamic, depending on the interplay of countless ideas, events, actions, peoples, etc. Now, more than ever, when the educational mission in general, and literature and the humanities in particular, have become suspect, it is important to be reminded of interconnections, especially among disciplines thought least relevant to one another: for example, molecular biology, medieval studies and creative writing – not an obvious interdisciplinary cluster.

The first course I co-taught with Bryan, a biologist, "From Beast Books to Resurrecting Dinosaurs", required multiple creative projects to understand changes in the historical

understanding of taxonomies, from early classification systems reflected in medieval bestiaries to Darwinian evolution and up through contemporary modelling. Students demonstrated their understanding of these changing concepts in poetry, performances, pictures and multi-dimensional constructions. Translating complex ideas from the scientific literature into radically different creative forms and then sharing the subsequent creations seemed to deepen students' understanding of changing theories, in much the same way my impulse to write fiction and poetry in response to difficult literature had served me.

What gnawed at me, and still does, is that creativity has historically been seen as belonging primarily to arts and humanities, to my discipline, English, specifically creative writing, rather than being integral to all disciplines, including the sciences and business. So, prompted by an unexpected call for grants, I approached Bryan about developing a course called "The Creativity of Everything" that he sensibly shortened to "Creativity".

The creativity course required students to re-mediate varied readings to represent or interpret key concepts. The first journal assignment, paired with articles by scholars in business and English, read as follows:

> Summarize one of the assigned readings for today. Then, **look** around your room (in the dorms or at home) and describe something you think represents, or could represent, creativity based on one of the definitions in the article—be sure to explain how whatever you have described serves to represent or support one of the definitions. Or, if you prefer, after you summarize one of the readings, **create** something you think supports, elucidates, or rebuts the definition of creativity in the reading—be sure to include what you created and your explanation of how it serves as support, elucidation, or rebuttal.

In short, from the very beginning to the final exam, students were asked to demonstrate comprehension: in this instance, starting with a basic summary; next, attempting a variety of applications of their choice; and, lastly, explaining how what they created served the stated purpose. Artist's statements would later accompany increasingly ambitious individual projects students devised with considerably less prompting.

After grades were submitted, we offered our now former students "extra creativity", namely writing with us, which we have done in all our co-taught courses. Here, multiple definitions of creativity emerge to serve the educational endeavour in the present. This year's "extra creativity" has involved identifying the insights gained into what creativity can mean and how this new knowledge could invigorate education, personal or institutional; the shifts of style and vision would represent each of our individual journeys while looking, however tentatively, beyond them.

Chaucer's *Canterbury Tales,* Bacon's *New Atlantis* and Cavendish's *The Blazing World* immediately suggested themselves to me, a medieval and early modern scholar, as models for a creative-critical experiment. Like these works, ours includes a changing community of pilgrim-travellers encountering alternative ways of seeing, engaging with new knowledge and

then reaching individual epiphanies. Unlike them, our focus is on creativity itself, which we suggest speaks to the future in all intellectual endeavours.

Though Cavendish and Bacon separated their critical commentary from their fantastical tales of newly discovered worlds, they recognised the power of promulgating their philosophical ideas through imagined expeditions involving encounters with new schools or laboratories of learning, research and production. Cavendish explains in her address to Noble and Worthy Ladies that because "most Ladies take no delight in Philosophical Arguments" (Cavendish, 1668), she offers a "Fancy", the *Description of a New Blazing World*, originally appearing as an appendix to her *Observations upon Experimental Philosophy*. Francis Bacon's *New Atlantis*, on the other hand, was published posthumously, without any introduction discussing the reason for this work, or its relationship to, for example, the *Novum Organum* that provides its theoretical foundation.

My admission is a confession. Though medieval pilgrims offered theirs in churches to atone for their sins, the tellers of Chaucer's tales reveal themselves as they journey while unspooling their creator's concerns with the ways of the world. As teachers and students, our stories detailed in this report represent how we have come to understand creativity and its place in education, and in our lives. The spectre of artificial intelligence gives urgency to individual voices working together to gain understanding and make art, too. What happens to Bacon's scientific method when a question becomes a command, a conclusion, a selective synthesis of all that's come before? What, too, to do with Cavendish's concerns with regard to distortion, the way the lens enlarges what is small beyond recognition?

Methods

A band of two teachers and their former students, having recently collaborated on a general education course in creativity at Penn State University and prompted by a call to consider "the critical power in creative work, and the inherent criticality of creative expression" (Juckes & Markidis, 2023), "potential forms and approaches to writing that makes and considers/reflects/thinks" and "hybridity in academic writing" (2023) used fiction as a vehicle to travel to an alternative university that admits an expanded role for creativity in learning. The exploring party included the English professor (Sandy) and the biologist (Bryan) who taught the Penn State course in creativity and those students who, upon completion of the course, expressed an interest in "extra creativity". These co-authors included a new graduate in writing and digital media whose undergraduate thesis studied the great blue heron (*Ardea herodias*) and the common tern (*Sterna hirundo*) from literary, artistic and scientific perspectives; a second-year student in biochemistry with interests in mathematics and music; a new graduate in accounting and a second-year student in biology with an artistic background. The teachers suggested the general direction of the journey, and the English professor created an initial literary frame. The former students and the co-teacher responded with prose, illustrations and

ideas that were sometimes shared with the teachers only and sometimes shared with the entire cohort, stimulating additional rounds of rethinking and revision, both on individual sections and the narrative assemblage. Then, the English professor reframed the story to clarify the criticality of the fiction and provide additional narrative structure, including a prologue, and, after each co-author contributed their revised tales, added commentary to link them. To illustrate how approaches from different disciplines may be combined, the biologist enclosed the work in a report that introduces the context of this literary journey, details the methods employed, presents the results of the creative endeavour and summarises conclusions from the pilgrimage.

Results

Prologue

And so I set out.

One way, then another and another. Walking aimlessly, I thought about old stories while half following the fluty call of a wood thrush.

When the singing stopped, I looked around and realised I had no idea where I was. I had somehow crossed a narrow bridge and now found myself on an island, or so I assumed, seeing nothing but water beyond the fringe of trees. How far could I have gone?

I should've known. After all, I work on arcana. Old books, dead languages. Not exactly cutting edge. But intuitive.

Magic words and wand waving strain credulity, raise eyebrows and suspicions. Casting spells seems too hit-or-miss. Wizards work alone, in private. Secrets are definitely not shared. Unlike science, at least in terms of process.

But scientific experiments do not always go according to plan, even with methods considered at the vanguard.

I take a breath. I look for something familiar: a goose, a pair of mallards, a great blue heron. Light.

I try to conjure.

***

The biologist's tale

As the lean figure stalks among the reeds, a slight breeze unsettling its beard, my students and I wait. I envy the bird's patience and optimism.

Long ago, when I first encountered one of these wondrous winged creatures, my instinct was to shoot it. Or, better yet, to trap it, stun it with a blow to the head and put it in a sack. In my laboratory, I would euthanise it, then pluck it and lay it on the dissection table. As I manipulated the wings, its still-pliant musculature would have rippled. I might have dislocated a joint in my eagerness, perhaps even broken a bone: humerus, radius, ulna, carpometacarpus. Digits. I would have slit the body from sternum to cloaca, peeled back the skin, run my probe along the pectoral muscles. With a hand lens, I would have examined the wing feathers – remiges, coverts, alula. The vane on the central rachis like a sail on a mast, branching barbs, interlocking barbules. Naming these parts would have felt like staking a claim, asserting authority. The animal, I would name, too. *Volans miraculum*.

This, I would do – no, I *did* this; I did as I was taught. For this is what had gained me entry into the University in the first place: my ability to scrutinise a thing, determine what made it tick. And I, in turn, taught my students to do the same. I had them recite what already had been discovered about *V. miraculum*, had them follow the steps I and other observers, experimentalists and theorists had taken. Together, we devised new methods to analyse and deconstruct the flying marvel.

The microscope proved instrumental. Also: centrifuges, chromatographs, spectrometers. Balances and incubators. Precipitants, solvents, dyes, and buffers. All manner of glassware. Mathematics. We observed and measured, isolated and assayed components, then reconstituted, reformulated, remixed. We bred the intact animals, not simply to replicate but to identify and examine the anomalous, mutants with altered behaviours and morphologies. We determined what was essential and in what way. We became versed in genetic code, deciphered *V. miraculum*'s assembly instructions. We believed that after we had extracted this information and could express it at will, manipulate it according to our designs, we could produce something useful.

Figure 1: V. miraculum. Image supplied by author.

The creatures, whose abundance once equalled their magnificence, became rare, at least in the wild. There were many of us who sought to make from the animal something useful, whether for satisfaction, acclaim or profit. We partook of its flesh, clothed ourselves with its plumage, decorated our homes and offices with its beaks and bones. We devised machines that mimicked its flight, crude imitations at first, then with greater sophistication. Many of us did not notice, or did not care, that our subject was dwindling. We had our records. We had our inventions, our technologies. We had our knowledge.

It was technology – that apparently inevitable product of our knowledge – that proved the catalyst, although it was the students, a new generation of them, who changed the trajectory. While I and my kind laboured to describe the form and function of this species in an attempt to understand life, others sought to create life anew. They engineered their own forms, with their own functions, robots capable of seemingly anything. These machines could take apart and reassemble any creature, winged or not, faster, cheaper and more precisely than I or any of my students, colleagues, competitors. The automatons already had slaughtered legions of workers in other trades. Now they were laying siege to our citadel. I anticipated a world where, in the end, humans served what they had created – or a world where machines served machines. Robots teaching robots what to make and how to make it, an utterly artificial existence, a life without life.

The heron strikes. A splash and a ripple as a frog narrowly escapes.

We leave the bird and its prey to their business and walk up the path away from the pond and toward the east campus. As it does most days, the magnitude of what the school has built over the years strikes me: what has been accumulated, and what has been demolished, too. I turn to my class. The students are passionate, bold, hopeful as ever. Why have you come to this place? I ask. What do you see when you enter?

They respond in fragments, pointed, gleaming, wildly disparate.

***

Maybe that illusion was too vivid. Dead bones. Body parts. Graphic. Effective. Scary.

I never had the imagination to call up such a world. That we find ourselves creating together is a marvel.

***

The visitor's tale

Last week I received an invitation in the mail. The envelope it arrived in was unadorned and unaddressed. I sliced it open and pulled out a piece of cardstock which read:

The SWAN
HILMA af KLINT

The details were sparse. The name of the artist and show was printed on one side, the date and address on the obverse. I was vaguely familiar with Klint, but her name evoked concepts instead of images. Abstraction, spirituality. The exhibit was being held in the chemistry building of a nearby university. An odd space for an art exhibit, but I had thought little of it until today as I stood in front of the building. A placard bearing the show title reinforced what I knew – I was at the right place. But as students in crisp white lab coats brushed past me, I began to feel uncomfortable. I was an intruder, crossing over into a space where I did not belong. I turned to leave, when I was comforted by the arrival of a coatless trio clutching invitations and appearing similarly out of place. They walked straight into the building. Gaining confidence, I fell in behind them.

Spread out across the exhibit room were 24 of Klint's paintings. But what struck me most were not the paintings, but the space in which they were displayed. The paintings were spread out in sequence across what appeared to be a working laboratory. There were benches, hoods, and cabinets cluttered with equipment I recognised (balances, beakers and burners) and some I did not. An epigraph to the show was stencilled onto the left wall, orienting me amid the to-ing and fro-ing of the scientists:

> From a man and a woman make a circle, then a square, then a triangle, finally a circle, and you will obtain the Philosopher's Stone.
> – Michael Maier, *Scrutinium chymicum*

Trying to ignore the scientists, I timidly peered around white-clad shoulders to view the paintings. The first piece in the series depicted a pair of swans, one black, one white, meeting at the centre of the canvas, their plumage contrasting both each other and their respective backgrounds. Their beak tips and wingtips met at – and subtly crossed into – the stark line horizontally dividing the canvas.

As I walked through the laboratory, the swans collided, an action that changed the birds and their surroundings.

Figure 2: Swans. Image supplied by author.

The collision introduced colours: pink, blue, yellow, red, gold. The swans became shapes. They curled abstractly and were bronzy like fallen leaves. They became concentric circles punctuating the centre of the canvas. They were nautilus shells, logarithmic spirals, the golden ratio. They were prisms, cubes and triangles. Then, finally, they were swans again.

But they were no longer separate as they were in the first painting. Their transformation, their *transmutation* had irrevocably altered them and their surroundings. They were tangled together, foregrounding a field of brilliant colour, the backdrop to their union replacing what once was black and white.

As I spent more time at the exhibit, I became more comfortable with the scientists' presence. I began observing them at their work, only to realise that they were not working, but looking at the paintings. They were visitors like me. Sure, they were likely students of the university, but they were strangers to this space as much as I was. I surveyed the lab equipment. There were no chemicals or even caution labels. They were props. Part of the show. But why?

Laboratories are not entirely out of place in the art world. Their functions are utilised to better understand the history of a piece, or its characteristics and makeup – to establish its material composition, to restore and preserve degrading pieces, and to understand the degradation to

prevent future loss. However, this did not seem to be the laboratory's purpose here. The goal, perhaps, was the presentation and mediation of contemporary art at the interface of art and science. Here, the laboratory had a thematic correspondence. It was a rational response to the mysticism and pseudoscience of Klint's paintings. Paintings that were, in turn, representational of embryonic systematic chemistry. As with the swans in the Klint paintings, the junction of the art and science resulted in something thought-provoking and unexpected.

The goal was not to stun, but, rather, to illuminate. What could emerge from the melding of other disciplines, other materials? What about methodologies? As I left the exhibit, I was again struck by the final image in the sequence. The generative power of the union of opposites – the two swans tangled together, colour radiating out from behind them.

***

Graduated into their own realms, the visitor draws from the laboratory and the atelier, creating new procreative combinations, to see and remake.

And though we – the biologist and fantasist – point out potential directions, each writer-creator finds their own way, from light and paint to sound and figuration. What is heard to be made.

***

The composer's tale

To compose, in its simplest sense, is to create, to form. Composition involves the assembly of smaller arguments into something greater and more complex. Essays are composed of words, songs composed of notes, molecules composed of atoms, equations composed of numbers. Composition and math had not been an apparent bisociation in my mind, but there I was, staring at the series of notes I had scribbled onto a piece of paper and their relation to a mathematical expression.

Figure 3: The infinite sum of C. Image supplied by author.

The infinite sum of C. Was this even allowed, or had I crossed some forbidden barrier between the worlds of math and music? No, it was allowed; it made sense to me. After all, these were the reasons why I had chosen *this* school.

My mind was alive like an orchestra before a concert, a chaotic yet beautiful harmony of mathematics and music theory. Melodies and phrases, both new and familiar, contributed to the symphony of thought that danced through the concert hall of my mind. *My* composition began to take shape, and though only in the confines of my mind for the time being, it was enough. The principal theme had been composed and it was poised to sing through my academic journey. I replayed the melody in my head...

Math and music, they are more similar than you think. I remembered the look on my advisor's face as she had spoken those words to me during our advising appointment, if you could even call it that. The Interactive Catalog was the name of the small dark room we had just entered. As soon as the door closed behind us, a giant holographic prompt appeared in the centre of the room: "Search…".

"Computational Musicology", said my advisor. A massive web of words appeared, reaching from the ceiling to the floor.

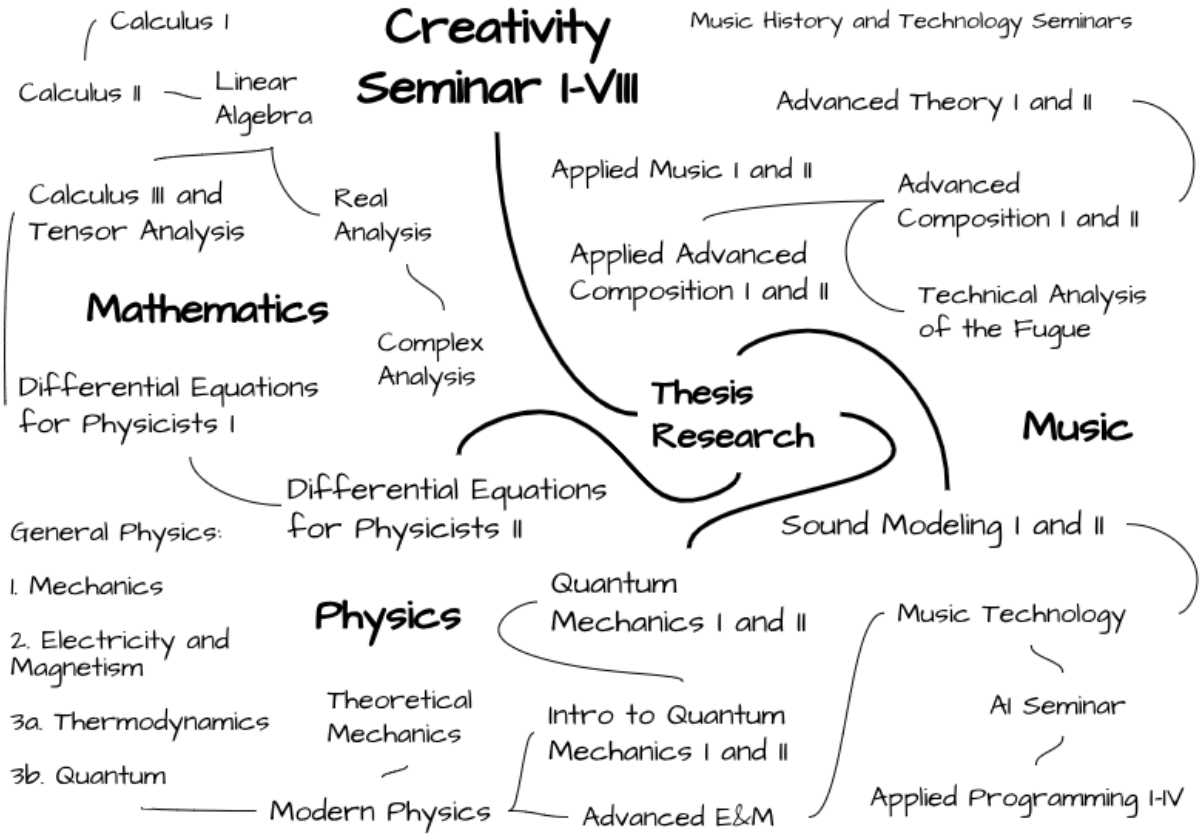


Figure 4: Creativity Seminar I-VIII.. Image supplied by author.

The 3D holographic words bobbed gently, inviting the user to interact with them through motion and voice.

“This is the Computational Musicology degree plan” said my advisor, “an interdisciplinary program with near equal emphasis on mathematics, physics, and music. Each of these bubbles is a course or series of courses required before graduation. Let’s dive into some of the highlights. Creativity Seminar”.

As the rest of the hologram faded, the “Creativity Seminar” bubble expanded, and a course description popped up:

> Students in all degree programs are required to enroll in the creativity seminar each semester. Each term, students are placed into new groups to promote diversity in thought and community across the entire student body. The creativity seminar emphasizes group projects, outdoor learning, generative thinking, and spontaneous activities. Thesis topics are commonly discovered during seminars, and interdisciplinary interests are strengthened and encouraged. Creativity seminars are often viewed as a period of exploration and deeper engagement with material rather than additional work for students.

“The Creativity Seminar is one of the two types of classes that emphasise the creative components of learning”, my advisor said. With a swipe of her hand, the course description vanished into the word web. “As students progress through their degree programs, their growing interdisciplinary connections culminate in the students’ creative thesis research”.

Just as before, the “Thesis Research” bubble took centre stage.

> Students in this degree program will complete two semesters of creative research with emphasis in science. Creative research may include anything from research about creativity, research creatively conducted, or a creative project. All research will be presented in a final thesis. There are five areas of creative research emphasis: business, law, medicine, science, and theology.

After reading the description, I followed the example of my advisor and waved my hand to examine other course offerings.

Sound Modelling I and II. A course description appeared, but this time, there were prerequisite course listings at the bottom.

> These two courses are the capstones of the Computational Musicology program and are designed to be taken concurrently with the Quantum Mechanics courses, a rigorous differential equations course specifically designed for physics majors (Differential Equations for Physicists II), following the previous music requirements. Sound Modelling I and II engage with concepts of wave mechanics and propagation, the

> physics of pitch and harmonic frequency, and further applications to analog and digital sound properties. Completion of these courses will provide a complete understanding of the scientific principles of sound, rounding out the interdisciplinary study of sound as both science and art.

“This is incredible,” I whispered, in awe of the beautiful union of science, math, and music. My advisor nodded.

“Consider what you can achieve when you approach knowledge as an interdisciplinary entity,” she said. “Math and music, they are more similar than you think”.

***

Did we say that?

Not even the biologist admits to math making.

Dreaming? Yes. That’s where we start, maybe where we end. Creativity birthed, believed. Midwifery?

***

The accountant’s tale

Years ago, I passed through a casket door into the room in which I would spend four years discovering the ideals of man, ideals I’m not sure I want to pursue. I asked myself, “Is this where my creativity dies?” I remember as a young boy knowing my destiny: directing a world of my creation, that generations after mine will be sharing with friends and family. But what happens when there is no support behind your dreams? Do you take the easy route and do what others want you to do, or do you take the hard route and take criticism from your family but do what you love? Since I was a stupid kid, I chose the easy route and walked through death-like doors I believed could never be creative.

I sat beyond these casket doors in the room they protected until one day I was forced through another door. This one was colourful, but it was also black and white. Sometimes it was bright sunny gold, other times dark brown like dirt. The first few days felt like torture. I wanted out of this door, to return to my casket, but two magical teachers didn’t want me to return to my doom. They wanted me to succeed and become more than a walking corpse. So they used their power to morph my casket door into my own personal golden gates of Heaven.

It may sound like these two had immense power, but they really were just two humans walking through doors like me; they just have been through thousands of doors more than me. When a person walks through the number of doors they have, that person gains knowledge, and that knowledge leads to power. One had gained sand powers, able to transform even the tiniest speck into the most priceless art piece the world has ever seen. The other gained an intelligent mind that outweighed mine 10-to-1. He could explain the world in a light that no one else could. Together they revived my dreams, giving me the support I thought I would never receive.

My door used to be cold to the touch, many didn't want to attempt to open it, but now it is ever-changing like the ones before me. I realised on my journey through my teachers' door that everything can be creative. Sand isn't just art: it's science, math, and language. Sand can be independent or work in a group to create something unique and original. I learned that intelligence is only relative to the topic at hand, and everyone has input. However, creativity doesn't exist unless you have both. You need reasoning and discipline to create art. Therefore when a passenger walks through my door, I preach that everyone is different and special. No one's dreams should be diminished, but supported so that the being above can witness the greatness that comes out of believing in others. It doesn't matter if you have no support or all the support, it only matters if you believe in yourself because others will follow.

I took this lesson into my own life, and I am on the path to seeing my dreams become reality. Although I am still practicing the ideals of man I didn't want to pursue, I am using the knowledge to fund my dreams. This funding is making the casket door into a gateway to the next door that I will one day enter: directing. One day this tale will change into *The Director's Tale* and my dreams will become reality.

This all reminds me of the most important lesson of creativity: creativity is always changing, just like the door of my teachers, this tale and life itself. Although ever-changing sounds like the past doesn't matter, the doors behind me are still open. In fact, every door that was once thought to be closed is in fact still open. That is what life and education are about, opening doors to places unseen, taking that knowledge to grow your powers and not being afraid to believe in yourself because teachers already do.

***

Pilgrimage as a door, window, mirror. We travel together. Become separated. Learn what we didn't know. Dream. Teachers and students.

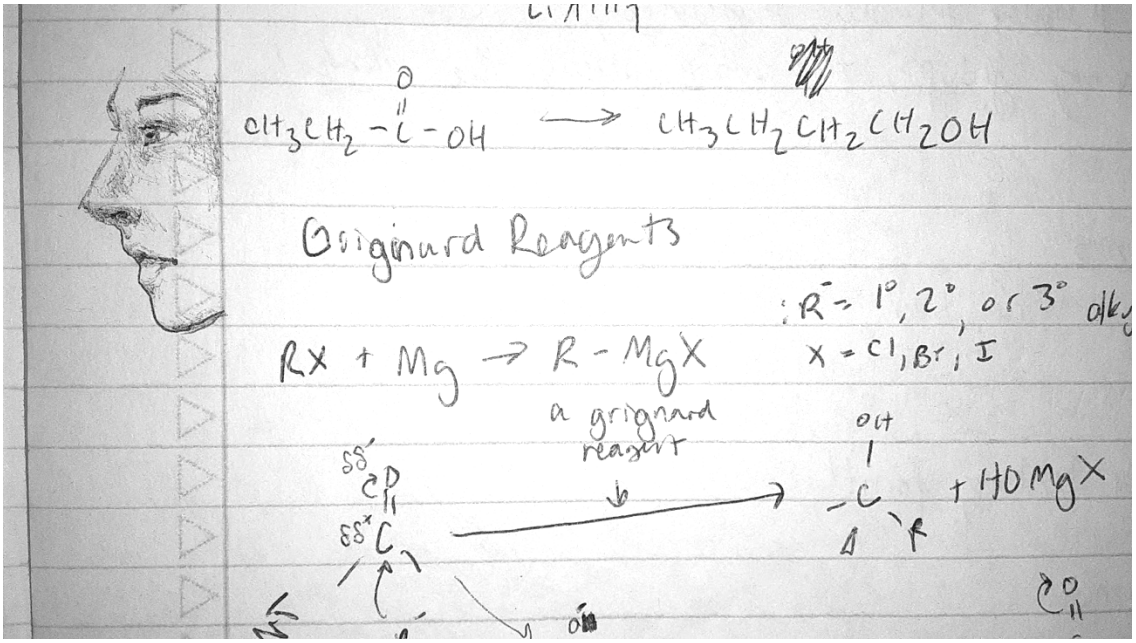
***

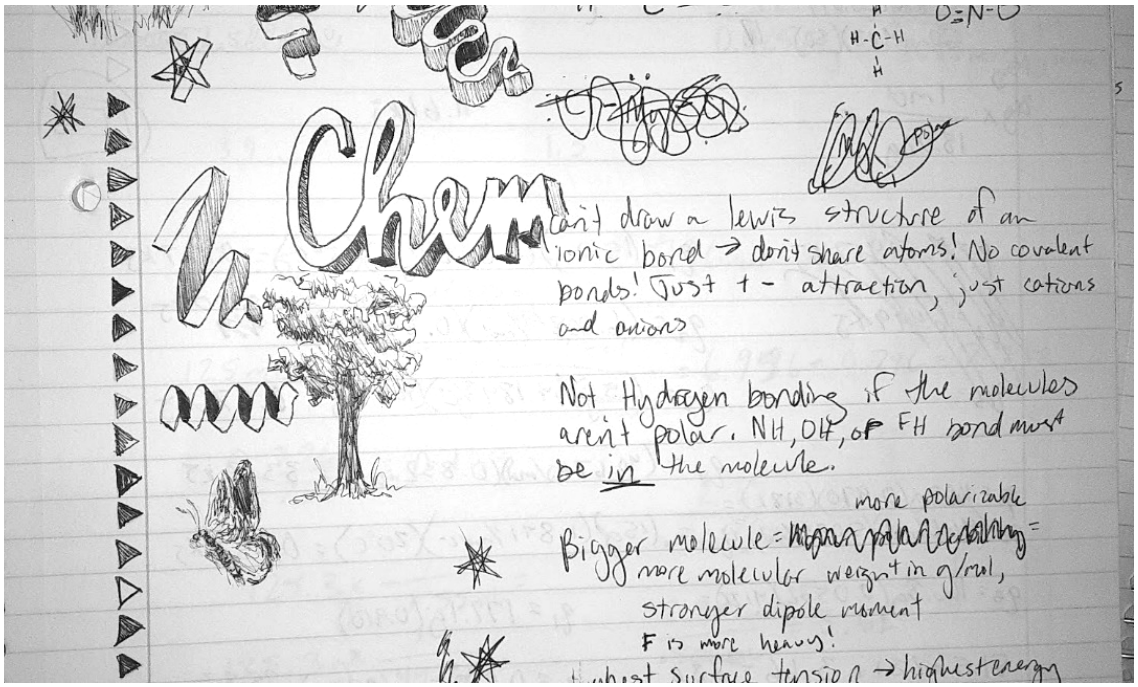
The daydreamer's tale

As I walk this tree-lined path again, I feel as though I've been gone too long. In fact, it has only been one summer, but so much has changed since I left the university last spring. I contemplate how it is that the time between now and then could pass so quickly and yet feel like an eternity. I look at these trees, now adorned with brightly coloured leaves, a sign of the arriving cold weather. Over the course of the past year, I have seen these trees transformed from their bare skeletons in winter to budding blossoms in spring. When I last saw them, they wore these same leaves in a shade of deep green. Aware or unaware, I walked past them every day, a witness to these seasonal changes.

Past times, passed time. As I think about these things, I arrive at my destination: the college library. I've come here to write. What is it about the library that helps me to focus, to imagine? Perhaps it's the old bookshelves, filled end to end with pages and pages of history, stories and information bound with colourful, gold-embossed covers. The wooden shelves remind me of the libraries I used to read about in storybooks, where magic and mystery, adventure and intrigue, were more than possible. Maybe it's the voices of other writers, stored in this place, waiting to be discovered. Or it is conceivable that while those qualities drew me to this place, it was habit that compelled me to return again and again to this corner of campus. I walk up to a table, sit down and set to work.

To me, imagining is painting a picture, as it were, in my mind. I build with the perspectives I have gathered, things I have seen, conversations I have had, and books I have read, a daydream, where my ideas take shape. Contrary to the typical depiction of a student drifting away from learning and into a less useful fantasy, in my experience, imagining helps my focus, and drawing helps me think. Using multiple facets of my mind simultaneously, taking notes and drawing pictures, allows me to better make connections between creative, problem-solving thought pathways and the problems presented in class, so I have always drawn pictures in my hardest classes. This past semester my organic chemistry notebooks were filled with faces and doodles beside my notes, just as my calculus notebooks were in high school. I confine my dreams to paper, occupying my hands while I listen to my lectures.





Figures 5 (above) and 6: Notebook excerpts. Image supplied by author.

Today, in the library, I begin with a familiar starting point for an imaginative journey: the mountains. Something in the profound feeling of my own insignificance in comparison with such large forces of nature, is comforting. A combination of different memories forms the image, the gold and amber glowing clouds blossoming in the distance, and mountains in focus before them, lit by the fire of the setting sun. Through their highest peaks a golden eagle flies, his regal wings spread, soaring among the cliffs. A focal point only for a moment, he seems motionless among the snow-covered ridges, like a speck of dust floating in rays of light, a grain of sand among the waves. He echoes my feeling of smallness but is not shaken by it.

Imagining the mountains evokes the same feelings that I have in my science classes. Whether it is calculus, chemistry, ecology, or cell biology, studying the fibres of the natural world reminds me of the complexity of the universe, the immensity of the wealth of human knowledge and the infinite information yet to be discovered. I am only one person; I pale in comparison to the unknown, just as the eagle is dwarfed by the mountains. There is an allure to this uncharted territory, the adventure that is the pursuit of knowledge. Here among the books, I know I could never read them all. I could never understand everything. I exist in a short period of time, time I see passing in the leaves on the trees. And yet change can happen here, progress can be made, time is progressing, the moment is now. As soon as the thought has formed in my mind, another image takes its place.

It is a tower, rising before me, climbing high into the sky. Supporting its numerous floors are columns the size of sequoia trees, each covered with thick vines heavy with flowers. I imagine walking into the image, breathing in the multitude of fragrances. The slender black blooms smell of rainstorms, the plumed orange of baked bread, the pale yellow of campfires on summer nights – the scents of the memories that shape them. Among them fly birds of all shapes and sizes. Hummingbirds whizz to and fro, drinking from the flowers, and a group of cedar waxwings hides among the leaves. A peacock struts past with an air of importance. High above my head a flock of flamingos fly, backlit by the sun, their pink plumage glowing. The birds are not flying alone. Dolphins dip in and out of open passageways, jellyfish dance among finches catching the light and a school of shiny mackerel fly past me in a whirl of scales and fins.

In the daydream, I walk through the columns into the great tower and happen upon a vaulted room, an amphitheatre. Floor-to-ceiling stained glass windows filled with intricate designs cast vivid hues across the floor. One in particular catches my eye: a sunset on the water. Slender-winged birds fly across a pink sky, their agile flight lifelike in the shifting of light. As I look, I realise that I recognise them, the sunset and the lake. I had seen this very scene from the deck of a boat heading back to shore, a parting look at the terns dancing. I should recognise them, since I have been studying their vocalisations and behaviours at the university and in the field for a year now. The memory is more than simply this picture. In the water there are sound waves, and in the clouds there are numbers and tables from our logbooks – our data, woven into the image.

As I look from window to window, I see that together they reflect the moments of my entire existence. There are the great historical figures of my textbooks beside my own close friends, and the designs of molecules and mathematical principles share space with my paintings. The images connect my memories of the past and my accumulated knowledge. They link contrasting paths of thought, like intersecting roads shown through coloured glass. I am reminded of a self-portrait I created as my final project in the creativity course I took last spring, a roadmap based on the contour of my face. When inverted, the image takes on the look of a city at night, seen from above. Intersecting roads appear bright, symbolising both the innovation sparked by collaboration that can occur when different people come together and the spark of creativity created when two contrasting planes of thought intersect, as discussed

by Maria Popova in her article “How Creativity in Humor, Art, and Science Works: Arthur Koestler’s Theory of Bisociation” (2013).

Figure 7: Self-portrait. Image supplied by author.

With visualisations of stained glass windows lingering in my mind, I look at my watch. When one plays creator, at least of daydreams, a minute can be a year, a year can be a minute. Yet I know I must leave the library eventually. There are deadlines in the present, in physical reality, a reality I can live and not simply create. And now, I must write, taking the formed thoughts across the threshold from my mind to the keyboard. As the evening fades to night, I close that door, perhaps prematurely, but I am finished. I look at the last period, behind my last word, a miniscule dot. It is a fraction of a millimetre, the punctuation of my thought.

***

The biologist’s tale: Epilogue

In the world of machines I had foreseen, the life without life, birds vanish and other marvels, too – one by one, then two by two, a near-endless subtraction to the infinitesimal. However, what the students have created are like glass shards, each brilliant, varied in colour, shape, and clarity but nevertheless complementary, fusing to form a lens through which what I see has changed.

When we walk together, it is unusual for me to see something my students have not already spotted. A measure of pride, then, and relief, fills me when they ask me which bird, hidden among the foliage, is singing, what the chittering and the whistling trills signify. I talk to the birds and translate. Their memory works differently than ours. They anticipate differently, too. They hold onto a quiet, primal awareness of themselves and their neighbours, avian and not.

I do not reveal that a machine taught me the language of birds, how apparently simple those sounds proved for the robot's synthetic intelligence. The students will learn it soon enough, along with the language itself. Their ears, like their eyes, are sharper than mine. For the time being, that I can hold such conversations with both students and birds heartens me.

So, my sense of things has shifted. Perhaps it is slowly, gingerly being transformed. I perceive how, when my students gather, they collaborate and create more than they compete and critique. I survey the areas between fields, that cross boundaries, that encompass several or many domains. When students are set free, they enter these open spaces. In them, they connect, imagine, make and remake. They are confident. They see their place in the creation of knowledge, and they see what knowledge – and questions – can make of them and their lives. They ask me what nature is and how it came to be. They ask me where the birds are going and why. They look around, and up, and ahead. Though we continue to destroy, we will continue to build – maybe a little more than what we eliminate: painting frescoes of wondrous winged creatures, raising our voices in communal song.

Conclusions

Scientists reach conclusions after consideration of data in the context of models – hypotheses – and then suggest future directions for exploration. In co-teaching with Sandy, I discovered connections between molecular biology, in which I had been trained, and (among other academic fields) medievalism, a discipline I'd never studied beyond tales encountered in my childhood. In our Beasts course, and later, in Creativity, we saw time and again how connections between different fields can foster new ideas and ways of representing them. We apprehended this while analysing and comparing the work of philosophers and experimentalists, painters and poets, sages in abbeys and monasteries and synthetic biologists – and we observed it in the remarkable work of our students. What our students created, however, didn't result only from the juxtaposition of material from different disciplines and the presentation of different genres. It depended on their having space to wander and chart their own academic adventures, having permission to ask questions and not necessarily need answers, to imagine and dream and play. Sandy had formulated this model of learning decades ago, it seemed. For me, someone educated in lecture halls, examined as an undergraduate for knowledge more than thinking, trained to reduce things rather than build them up, a new power had been revealed.

For a few years, then, I believed that creativity was not only an entry into learning, but that it needed to be at the heart of education, that as automations relieved workers of their means of making a living, creativity was the one thing that would remain for making a life. Teaching the creativity course with Sandy in the semester that generative AI first became a household term has made me wary, though, of even that conclusion. Perhaps it's still debatable whether robots can be creative, a question that depends on definitions, but I wouldn't bet against technology in the long run.

When Sandy and I were planning a field trip in the creativity course, we hit upon the idea of including the trip as part of a midterm exam. I thought we could ask the students to generate an itinerary and then write about how what they saw on the trip related to ideas studied in the course. Instead, they created an assignment – together – in which they would document examples of creativity encountered in the field trip, present their observations in a salon that evening over dinner and then use what they had learned from their classmates as well as course readings as the basis for making new creations, which they would present to the class the following week. It was not only creativity that they valued, but collaboration, too.

The return from the field trip was nearly three hours long; for nearly the entire ride, the class played riddle games – Green Glass Door, Black Magic, The Right Party. All eighteen students played. Later, some of them wrote about it. There is hope in that, I think.

Figures

All figures within this article are provided by the authors.

References

Bacon, Frances (2000). *The new atlantis.* Project Gutenberg EBook. https://www.gutenberg.org/files/2434/2434-h/2434-h.htm (original published 1627).

– – –. (1902). *Novum organum*. Online Library of Liberty. https://oll.libertyfund.org/title/bacon-novum-organum (original published 1627).

Bolter, J., & Grusin R. (1996). Remediation. *Configurations, 4*(3), 311–358.

Cavendish, Margaret (1668). *The description of a new blazing world.* Maxwell. https://digital.library.upenn.edu/women/newcastle/blazing/blazing.html

Chaucer, G. (2000). *The canterbury tales*. L. D. Benson (Ed.). Harvard. https://chaucer.fas.harvard.edu/pages/text-and-translations (original published 1392–1400).

Feinstein, S., Costello, C., Folck, A., & Muret Bate, J. (1996). At Home with Multiculturalism in Kansas. In G. Tayko and J. Tassoni (Eds). *Sharing Pedagogies* (pp. 67–79). Boynton-Cook.

Feinstein, S. (1999). The peripatetic approach to teaching the gothic. *Thought & Action*, 39–47.

Feinstein, S. & Wang, B. (2023). From old books to new science: Rethinking models, Recovering Meaning. *Pedagogy* 23(2), 349–361.

– – –. (2022). How is what and what is how: Research and writing in an integrated biology and literature class. *SPUR*, *6*(1), 43–47.

– – –. (2021). Mixing medievalism and molecular biology in the age of Covid-19. *New Chaucer Society: Pedagogy and the Profession, 2*(2), 94–112. https://escholarship.org/uc/item/0qg647jn

Juckes & Markidis (2023). Creativecritical Writing Now CFP. *AAWP.* https://aawp.org.au/call-for-papers-creativecritical-writing-now/

Popova, M. (2013). How creativity in humor, art, and science works: Arthur Koestler's theory of bisociation. *The Marginalian*. https://www.themarginalian.org/2013/05/20/arthur-koestler-creativity-bisociation/