

A Synthesis: Comparing and contrasting my experience in the two areas of scientific/ technical writing and reflections on classroom learning

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Abstract

This report is a synthesis of my experiences in the applied physics program preparing to enter a career in science communication. I compare my experiences in academic writing and professional writing to my experiences in my physics classes. For academic and professional writing, I go through how I was hired in the positions, my main responsibilities, and what I learned. My positions in academic writing included being a writer in the dean's office in CPMS, being a writing tutor in the Research and Writing Center and being an intern for the technical writing company Niche. For most of these jobs, I learned how to be independent, how to talk to scientists, how to collaborate with others, and how to write well. I then synthesize these experiences and compare them to my academic training, noting that I received a lack of training in a competitive news environment, and a lack of training in searching out my own 'beat' for science stories. I compare my professional training to the academic training I received and note that I feel very prepared to tackle complex scientific issues, and confident in my ability to belong in a male-dominated science environment. I then advise future students on a potential roadmap for those that are interested in pursuing a similar path, such as taking many science classes, and participating in research. I also advise future students to seek internships sooner rather than later.

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Comparing Academic and Professional Scientific Writing Training

Being a science communicator has always been my long-term career goal. This is a report of my struggles to achieve this as an Applied Physics major with an emphasis in communications at BYU. In this report, I write specifically about my experiences preparing for a career in scientific or technical writing in three contexts— academic, professional and in the classroom. My audience is students who will come after me. I anticipate that this reflection will provide one potential roadmap with examples from my experiences. This may aid other students who are interested in technical professional writing in the sciences and are contemplating doing a capstone like mine. While the metrics I used for this reflection relate to many of my BYU classes, I specifically discuss how my career preparation connected with elective classes I took as an applied physics major. These elective courses were in the English and Communication departments. I also compare these experiences to potential job opportunities, including job requirements and what others have said about the professional writing job experience. These jobs include writing for science journals, as well as working in writing centers specifically focused on assisting other students interested in combining the sciences and humanities.

My first reflections are of my experience on campus, writing in an academic context. I begin with a discussion on experiences I had writing for the dean's office in the college of Physical and Mathematical Sciences, which I did from January 2022 until graduation. My responsibilities included interviewing professors and students to write articles for the college website. I also draw on my experiences working in the Research and Writing Center located in the HBLL building, where I was a writing tutor to students across campus. These campus job experiences span 2 years, from January 2021 until graduation. I then reflect on my professional technical writing experience, when I was an intern for the technical writing company, Niche in the summer of 2022.

Throughout this report, I will expand on several important skills that these experiences taught me. I compare and contrast how effectively I believe these different experiences prepared me for the career I

plan for myself. I will also discuss the relevance of what I learned in my Applied Physics electives to these experiences. Since my report will be archived at the physics website, I anticipate that students interested in combining physics and writing through the Applied Physics capstone will find some useful guidance.

Academic Scientific Writing

Dean's Office- Finding my way to employment as an interviewer/writer in my college

Dean's Office- How I got the job

A friend posted about an article that she had written for the life science department on her social media. I asked how she published her work. She said that she worked for Kimberly Jenkins, who was in the life sciences at the time and gave me Kim's contact information.

I attempted to contact Kim several times but never heard anything back. I was somewhat discouraged and talked to one of my professors, Prof. Gus Hart. I told him that I felt discouraged because there seemed to be no way for me to get in contact with Kim, who I anticipated could be a good mentor for me. It felt like there was no way for me to achieve my dream of being a science communicator. The next week, Dr. Hart told me that he had talked to Kim about my situation, and that she desired to hire another student writer! He told me that I should go to the dean's office and speak to her more about it. After a successful conversation with her, I was hired and I worked there until my graduation June 2023.

Dean's office- Main responsibilities

Typically, Kim told me about research that had recently been published, or notable accomplishments by students. After being notified of someone's work, I would typically spend about 2-3 hours researching the field they are in, and understanding the specialized technical language, i.e., jargon. they will likely be using. This research helped me prepare questions for the interviews, as well as to understand what they will be discussing.

My personal research helped me explore and study new topics in a quick, organized manner to find the exact type of content that I need to prepare. Typical interviews lasted around 30-45 mins, as I give the student or professor opportunities to discuss their research. I learned how to ask effective questions. These included open-ended questions that prompted the interviewee to talk for most of the time, as well as direct, clear questions that were specific to each interview.

Dean Grant Jensen recently requested emphasizing the “BYU-flavor” of research done at our institution, so I asked students and professors the impact that their research has on their faith, or what BYU values impact their work. It was an incredible experience interacting with students and professors performing various types of research, and it was really satisfying to take small dives into their work. It was also fun to interact with different faculty and learn their stories. I learned that BYU places a special emphasis on undergraduates and prioritizes their learning much more than most research institutions typically will.

After I’ve conducted the interview, I would review my notes and the transcript of the interview and form various outlines of how to piece together a story out of what they’ve shared. I translated their research to prose that the intended audience -students and alumni- would understand. This was the hardest part of my process, and I often ran into what felt like dead-ends. I found it was helpful to just put something on the page, and trust that I would rearrange the content later. The biggest lesson I learned was to *just start writing*, even when it feels like it’s not going anywhere. From my first draft, I would begin the rigorous editing process and run through drafts with my supervisor. I ensured that the student or professor got 1-2 read throughs of the draft. Dean Jensen was also involved in the editing process. This process would sometimes be arduous, but at the end, the product was typically a mix of everyone’s feedback to get the clearest, most engaging article possible. This process taught me that feedback and even criticism of my writing wasn’t feedback of my abilities or even who I am as a person. I viewed this feedback as something to produce the best possible version of my work. After this long editing process, the article was posted on the college website, and the whole process started again!

My job in the office also included various editing projects for Kim, the communications manager. These included editing a video script for alumni, editing monthly newsletters, editing speeches for fundraising events, or editing other website content. These editing ‘odd jobs’ taught me how to pay attention to details and honed my ability to communicate effectively to diverse audiences.

Dean’s office: What I learned

My experience working for Kim at the dean’s office taught me how to persevere. There were many times where I had to advocate for myself, to ensure that my work was being looked at by the necessary parties for the articles to properly progress. I helped develop a new system for professors and the deans to review the articles, streamlining the editing process. There were several times where I needed to push past my own discomfort of “bothering” people, which would happen when people I had asked to review my articles had not done so in the time frame I had expected. I would continually remind them and ask them to complete the tasks they had agreed to do, which ultimately resulted in achieving my desired results of publishing the articles I’ve written.

I learned plenty of ‘hard’ skills as well, including interviewing, drafting, writing, and editing. I also learned the value of using my friends as a professional network and asking them questions about how they achieved goals that were similar to mine. I also learned that my professors are invested in my goals and can use the connections they have to help me achieve what I am unable to do alone.

Research and Writing Center-Writing experiences that taught me as I helped others.

Writing Center- How I got the job

When I was a sophomore, I realized that I needed more writing experiences than my physics major was giving me. I happened to see an email from the physics undergrad mailing list, which had a flier for the research and writing center that it was hiring and accepting all majors. I felt extremely under-qualified for the position, but I was intrigued by the possibility. I attended their open-house, and asked if

they would be interested in a physics major. Their answer seemed encouraging, so I applied. I was interviewed and offered a position.

Writing Center- Main responsibilities

My first semester at the writing center, I was a part of the internship that trained me for the center. In this internship, I was given tools and experiences necessary to learn the ins and outs of being a writing tutor. I discovered a whole world that included terms like ‘pedagogy’, ‘scaffolding’, and ‘reverse outline.’ I learned about tutoring, about writing, and about tutoring writing. I also learned to emphasize tutoring writers as individuals, not just seeing them through the lens of their assignments.

My job as a writing tutor consisted of meeting with students during my shifts, along with weekly training meetings. In a typical session with a student, I would spend the first few moments getting to know the student, to know how to best connect with them and their experiences. I asked them about their assignment, and generally about how the class is going. Once I gained this information, I assessed the needs they described, and formed a general plan for how the session could go.

Sessions never went perfectly. The priorities of the student sometimes didn’t reflect the true needs of the paper. There was a fair amount of compromise that had to occur. I would inform the student of the needs of the paper that I notice, and they would respond with how that compares to their perceived needs. This negotiation was easier with some students than with others and depended on their attachment and commitment to their writing. I balanced my feedback between clarity and directness with gentleness and hedging language. This was intended so the student clearly understood what I was addressing, but they still felt like they were responsible for their paper. After five semesters, I still felt like every session was a new opportunity to juggle the needs of the student with the needs of the paper, and I loved incorporating the student’s personality and assignment type into the direction we took. Being a tutor at the writing center was challenging, but it was engaging and rewarding. My favorite sessions ended with the student feeling satisfied with the growth they’ve gone through as a writer, with an ability to recognize how they could move forward as an improved writer.

In my last two semesters at the writing center, I was promoted to be a student administrator (SA). Duties in this capacity included creating weekly training sessions for the other tutors in the center, meeting individually bi-weekly with. My first semester as an SA, I was over resource development, which meant I handled the resources that were available to tutors and to students. In this capacity I helped create an inaugural graduate student boot camp, which was a 6-hour tutoring program for graduate students. To create this program, I researched what other universities had done for graduate students, set up the applications for the boot camp, vetted and accepted applicants, as well as created a training program for the other tutors. Most tutors typically feel worried when graduate students come into the center, so my training program was intended to boost the tutor's confidence and show that they already had the skills they needed for graduate students. The success of the first grad student boot camp has led to a reoccurring program each semester. The director of BYU graduate students was made aware of this program and authorized the writing center to hire two full time graduate tutors! I feel proud that my efforts have resulted in such positive outcomes for the outreach of the programs I've invested in.

For my final semester, I was an SA over Course Embedded Consultants (CEC). CECs are placed in a specific class, attend the duration of the class, and become experts in the course material to support the students in writing assignments. In my time as a CEC, I met with the instructor and TA's weekly to best understand their expectations for the assignments. I also created materials for the students to understand assignments better, which I would present in class. As an SA, I met with the other CEC tutors every other week and created training meetings biweekly. I supported the CEC's and often provided a listening ear, advice, and stress relief. Also, in my role as an SA, I met with one of my supervisors, Zach Largey, weekly and we created training programs and materials together. He has also been an incredible mentor for me, and we have enjoyed a great friendship.

Writing Center- What I learned

In my first semester as a writing tutor, I completed numerous readings about being a writing tutor. I learned how my conventions of "good" writing have been impacted by my education in America; other

countries have other conventions of what entails good writing. For example, in Asian countries, the thesis is never stated at the beginning, and the argument builds up to it. This completely changed my perspective, as I realized that there was no set definition of good writing.

I began to approach tutoring as a collaborative state. Instead of going into a session with a clear mindset of what needs to be “fixed”, I ask the student a multitude of questions. I learned that by asking questions, I can more effectively assist the student in their needs. Also, through hours of sessions, I learned that the responsibility of the session does not lie simply on my shoulders. In my first few sessions, I was very stressed about balancing the needs of the student versus the needs of the paper versus the expectations of the professors versus what knowledge I had, all while keeping track of the time left in the session. I have since adjusted my way of tutoring and offer suggestions to the student of what could be done to the paper, leaving the final say up to the student. I feel like I have refined my understanding of what collaboration looks like.

More generally, I have learned the importance of connecting with someone to understand them. There have been times where I blunder through a session, and I realize at the end I wasn't able to help because I wasn't focused on connecting. Even in times where I am focused on connecting, sessions are messy! Human relationships are messy. I know that this skill of learning how to connect with people both quickly and deeply will help me in whatever position I have in future careers.

I also learned the skill of self-starting, and leadership. I applied to the SA role and gained large amounts of satisfaction in helping other tutors. I applied the skill of connecting, as I focus on the individual tutor when I meet with them and in training meetings. I learned how to compartmentalize things in my life; when I was having a bad day, I could just focus on the student I'm meeting with. However, also the reverse is true—when I had a bad session, I learned to let it go. I believe these skills will help me in my career as I leave my beloved writing center.

Professional Technical Writing

Niche Associates- Technical Writing Internship Experience

Niche- How I got the job

Fall semester of my sophomore year, I started looking for internships for the fall. I connected with my advisor, Dr. Allred, and explained the path I wanted to take with my degree. He connected me to the company his daughter works at, which is Niche Associates. The organization creates content for technical companies, which includes training, marketing, and visual content. I was interviewed in October, and then was hired on as their first intern. They appreciated my scientific background, and apparently Dr. Allred gave them a stellar letter of recommendation, vouching for my ability as a communicator. (Which I didn't even know about until the end of my internship!)

Niche- Main responsibilities

When I first started, I mainly worked as a copyeditor, which meant I was the last set of eyes on a project before it launched. I looked for spelling, visual, and quality errors, and suggested changes to the project manager. I was grateful for the previous semester of working in the writing center, which had brought my grammar and writing skills up to speed. As I progressed, I began to take on more projects with greater responsibilities. One project I really enjoyed involved first starting as a data transfer and quality assurance checker on a dataset. Subsequently I was able to help create the training materials for it. In fact I was the one who was mainly in charge of creating these. I created a system in Excel that would efficiently organize the data and check for redundancies. I also helped train a new hire on this project.

I also got to create multiple-choice questions for the sales certification based on several different training programs. Some training programs I was familiar with and had helped create, but some training programs I just jumped in to help create the certification questions. Creating original questions was incredibly tricky! It took me several rounds of oscillating between questions that were either too complicated or too simple. I received rounds upon rounds of feedback from several project managers. Some managers were kinder than others in their feedback, but they all helped me move forward in the

process of creating more effective questions. After several weeks, I began to work on several projects at once, including various types of copyediting for different project managers, as well as continuing in creating questions for the certifications. I also read chapters-long manuals and then diffused the content into page summaries.

Niche- What I learned

Receiving feedback from various types of managers helped me learn to not take criticism personally. Initially, after sessions where I received feedback, I struggled with the motivation to continue creating content. I felt like I was not good at what I was doing, so why should I continue? However, I realized that this feedback was intended to help me move forward, rather than to stop my progression. Learning how to incorporate my managers' responses to my work helped me become a better employee.

One challenge I had to overcome in all these projects was being self-started. I worked remote for most of the internship and even when I was in the office, I was typically the only person in a room. I realized that I needed the social pressure of other people around me to be productive, or to have very clear deadlines if I do need to work alone. I found ways to keep myself engaged in the assignments I was doing and made sure to take breaks to stand and walk around. I realized the difficulty in working for 8 hours a day, and the personal limits I have in doing so.

This internship was also helpful in realizing that I did not have an interest in technical writing. I found that I could be good at producing this content, and especially in editing it, but the internship passed by slowly. Although it was interesting to learn about the details of various technologies and how training certifications worked, it was not typically engaging. I know that I could do technical writing for a short time in my career, but this internship ultimately taught me that it probably could not be my entire career. I think internships are effective for that very reason, to showcase new possibilities and rule others out.

Synthesizing the two experiences

Preparation for future career

From my experience at Niche, I realized I want to focus more on science journalism. Technical writing and editing jobs are in higher demand, as lots of organizations need individuals that are competent in communicating complex information. I could see myself working in one of these jobs for a couple years, but I do not want my entire career to be in technical writing. As I spent more time at the dean's office, I realized how much I enjoyed interviewing and interacting with the professors and students who have fascinating research. I loved hearing their passion regarding their research, and then wrestling with that research to bring it down to a level that lay people would understand. Science communication is not easy, but it has been extremely helpful to have experiences that have reinforced my desire to work directly with scientists and then communicate it to the public. I want to be at the intersection of these two groups and bridge the knowledge divide.

Although my experience in the dean's office has provided the reinforcement to my conviction of pursuing science communication, it has not completely prepared me for a future in this career. Although I have experience interviewing and writing articles, I do not have experience with strict deadlines. I anticipate that in a more journalistic environment, the deadline of an article is a large driving force. However, in the environment at the dean's office, I was often the one that reminded my supervisors that they need to review my articles so they can move forward. There were often times where I was left without projects, and I had to be self-guided in how to move forward. Although this job taught me initiative, I do not have much experience in a fast-paced newsroom, which could negatively impact me in my job search after graduation.

Course Integration

Due to the physics major, most of my courses were focused on technical training. I learned the ins and outs of the current state of physics academia, which would be helpful if I was pursuing an advanced degree in physics. I appreciate that the applied physics major offers an incredible amount of flexibility in

the last two years of the major. Due to this specific major, I was able to take writing and communications classes that otherwise would have prolonged my college experience. I was able to graduate in four years because of the flexibility that the applied physics major offers, and it gave me the technical and writing training that I desired.

My physics classes taught me how to persevere. From my very first course, I have been incredibly academically challenged. Physics is not easy! At every point of not knowing how to move forward in solving a problem, at every point of feeling like I potentially didn't belong in the sciences, I have continued. I attended the Conference for Undergraduate Women in Physics, and I feel like one organizer stated it best when she said, "we become comfortable with uncertainty every time we do physics. As soon as we reach a point where we fully understand something, we move forward, we move on to the next problem and the next unit and the next topic to research." My physics classes have taught me this same comfortability with uncertainty, and how to move forward even when I don't know how.

My physics classes have also taught me the value of collaboration. My education would have been impossible without the study groups I have formed. The friends I have made in these study groups have encouraged me to continue persevering and have filled in gaps of knowledge. There have been many times where we teach each other while doing the homework, which has cemented our own understanding of the material. Additionally, the jokes and laughter we enjoy helps the arduous homework become bearable.

I struggled with a feeling of belonging for my first few semesters, largely due to the imposter syndrome that came with being a woman in a male-dominated major. I also felt imposter syndrome because I didn't want to stay in a science career. This made me feel too 'write-y' for my science friends, and too 'science-y' for my writing friends. It was scary forging my own path, but I know I was able to because of the friends and mentors I gained. The lessons of perseverance and collaboration deepened my conviction that I do belong in physics. It's ok that I was a deeply average physics student, who didn't want a career in physics per se. I belonged in the physics major!

My writing classes taught me how to communicate. Such is to be expected, but this intentional space for writing training has been helpful also in increasing my confidence in my communication skills. When I applied to the writing center, I was so nervous because I felt like an imposter with absolutely zero writing training at the collegiate level. The internship through the writing center gave me this formal academic writing training. I also took a course in professional writing, where I learned skills in technical, proposal, and marketing writing.

Within the emphasis on communication, I have much more experience in academic writing than I do in professional writing. This is to be expected out of someone spending multiple years at an academic institution, but it does make it tricky to be competitive in the job market.

Advice to Future Students

To expand on my hopes for future students, I will restate the main points of what I learned along my journey. In the beginning of your own journey, consistently look for opportunities for what you're interested in! I discovered internships the last semester of my senior year that were designed for sophomores and juniors. Don't be afraid to google opportunities, but also ask people you know. I didn't realize how much the people around me knew about what I was interested in, and the connections they had. I also didn't realize how much people like helping students. Professors, and even alumni, will go to great lengths to connect you to wonderful opportunities.

It's going to sound cliché, and you can probably get this advice in a million different places, but I would implore any future student reading this to not get discouraged! The first couple years of school are overwhelming because there are so many unknowns ahead of you. You will figure your future out, one step at a time. As long as you are working hard, and trying to expand your comfort zone, you will find opportunities and connections will be formed, with the help of friends and mentors. It's easy to look back and see how the dots connected, it's much harder to stand in the middle of dots and see no way forward! Just keep putting yourself out there, and things will come together.

For a student interested in pursuing technical writing, I would recommend a similar track to what I have done. Get a degree in a technical field, potentially even an advanced degree, and try to specialize in an area the last few years of your education. I would recommend a minor or emphasis in professional writing, to have formal writing training. There are many possible important routes, such as proposal or grant writing, or technical editors for journal publications. The technical degree will give you the required skills of understanding complex situations, with the required writing training that can come from a minor or emphasis.

For a student interested in science journalism, I would recommend a slightly different track. I would minor or emphasize in journalism and try to take more journalism classes. I would also try to get a journalism internship your sophomore or junior year. I would also try to work for the daily universe or y-magazine, as both have potential science stories. Working for the dean's office was helpful in focusing on only writing science, but until they create a more established set-up for student writers, I think the other two writing outlets would give a student more applicable skills for a newsroom.

For either student, I would recommend participating in research. BYU offers incredible opportunities for undergraduate students, and that is an experience I regret missing out on. It's true that you will have to decide which opportunities to choose, and you cannot do everything, but I would recommend working to make research a possibility during your time at BYU.