

# A Behind-the-Scenes Look at Access Setup: A case study of the Deaf Professional / Designated Interpreter model in engineering education research

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**Abstract**— Since the advent of the Americans with Disabilities Act (ADA), providing access and accommodations to disabled students has become increasingly commonplace at many US colleges and universities. However, these processes do not always translate well into the professional and necessarily fluid context of engineering education scholars. This paper is a case study describing our experiences in realigning processes to provide access for one particular deaf scholar at one particular small institution, along with some reflection on how this case study might benefit others. The notion of a “turnkey solution” is a myth for disability accommodations in many professional positions, and that perpetuation of that myth can create barriers to full participation by disabled scholars in our field.

**Keywords**— access; accommodations; disability; ASL; interpreting; deaf; deaf professionals; autoethnography; employment

## I. BACKGROUND AND MOTIVATION

Engineering education is a rich and varied field of research. Scholars use a broad range of methods to probe the experiences of students, educators, and professionals, assess impact; improve outcomes, and understand connections across disparate and diverse contexts. The professionals who conduct this work bring quantitative and qualitative skills drawn from engineering and other STEM fields, social sciences, and the humanities. Our work is deep and complex.

The scholars who undertake this work are a diverse group of people, and we all benefit from the broadest participation of varied voices in our work. We take pride as a community in supporting and maintaining this diversity. Yet, even in a world where we increasingly incorporate principles of universal design [1] and provide effective accommodations for a broad range of disabled students, we often lack the structures and mechanisms that would give our community access to their contributions as they graduate and join us as engineering education scholars.

The professional lives of engineering education researchers are often different than the educational lives of undergraduate and graduate students. Undergraduate and graduate students do their institutional work largely in predictable and regularly-scheduled contexts: courses that meet every week, syllabi laid out for the semester, seminars announced a month in advance, and so on. Institutions therefore provide disability accommodations to students in ways that rely on that

predictability and regularity. Accommodations are set up at the start of the semester with the expectations that adjustments during the semester will be minimal. Exceptions to this norm are infrequent enough that they can be handled on an ad-hoc basis by both disabled people and their supporting institutions.

Inasmuch as faculty and staff positions exhibit similar patterns of predictability and regularity, these turnkey institutional structures and mechanisms can sometimes be serviceable to them as well. However, scholarship in engineering education is often fluid, responsive, emergent, and spontaneous, precisely because it explores unknown boundaries. At the advanced-graduate or postdoctoral level (and beyond as faculty and administration), this adaptive fluidity is a prerequisite to high performance in many areas of the job, and to contributing substantially to a quite new field.

As exceptions to a predictable, regular schedule become increasingly common for a disabled scholar, handling each exception to the turnkey infrastructure on an ad-hoc basis becomes an increasing burden on them and the colleagues they collaborate with. If models for disability accommodations for engineering education scholarship are solely based on models developed for less fluid roles, disabled scholars and their colleagues will be hindered by conflicts between the fluidity of advanced roles and the rigidity of assumptions about disability accommodations. In this paper, we make these conflicts visible within a particular and concrete scenario of disability accommodations for an engineering education scholar that stretched the capacities of our institution.

We offer this case study to highlight gaps in current approaches. It is important to note that our narrative is intended to frame the problem, not to offer a solution. In other words, we think our stories have the potential to highlight the sorts of access implementation challenges others might face, but we do not want readers to mistake our early-stage experiments for finished turnkey solutions to copy. In fact, one of the biggest challenges we highlight is the need for adaptive access setups that are particular to the people, places, and situations involved, and one of the biggest takeaways from this paper should be that the “turnkey solution” is a myth for disability accommodations in many professional positions.

Many universities may believe that they’ve “solved” disability accommodation because they are able to support their students. As we draw more professional scholars with

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disabilities into our ranks, we will need to learn how to adapt and accommodate to their diverse and highly individualized needs. Most significantly, this is work that we must all undertake as a community. If our field relies solely on those with disabilities to create solutions, we force them to channel their energies into that activity rather than undertaking the deep, important, and particular area of scholarship for which we've recruited them.<sup>1</sup>

## II. OUR APPROACH

In this paper, we present a collaborative autoethnographic case study of setting up accommodations for a deaf postdoc. Case studies are appropriate for examining a rich incident in situated detail and allow for a wide range of analysis and writing approaches [2]. To unpack our case, we have chosen a collaborative autoethnographic approach [3], which has been used by other engineering education researchers to examine complex topics from multiple viewpoints. These topics include transdisciplinary team teaching from the perspectives of both an artist and an engineer [4] and spirituality in engineering education from the perspectives of a Quaker chemical engineer, Catholic lay electrical/computer engineer, and Evangelical Protestant civil engineer and minister [5].

In this paper, we examine one case of accommodations: a deaf postdoc at a small institution. We do so from the perspectives of the postdoc (**Mel**), postdoc supervisor (**Lynn**), and designated interpreter (**Brittany**). The specifics of all three voices are important; one reader characterized this paper as written by “a deaf person and some collaborators,” and this is exactly this perspective that we are trying to combat. Mel was not just “a deaf person;” she was a postdoc, and the accommodations we designed were specific to her professional role. Lynn and Brittany were not “some collaborators;” they were key players with unique and critical contributions. To conceptualize our work as centered around one person whose salient feature is being non-hearing is to miss the point entirely. Our approach was fundamentally that of a team of three.

We denote switching among the three speakers with our first initial (**M**, **L**, and **B**) and a colon at the start of a paragraph when a transition occurs. Separating our voices allows us to make visible how our individual actions and perspectives changed over the course of the narrative. Together, we create a picture of the ways a traditional model of providing access was failing, and what we individually and collectively did in response. We begin by introducing ourselves as the narrating characters, then step through the narrative of our case study in five parts: identifying the need, legal/institutional considerations, what our eventual setup looked like, challenges we faced in developing it, and mistakes we made along the way. This choice of focusing on narrative particularity [6] rather than broader statistics and generalizations was driven by a dearth of records of these kinds of experiences in our field.

Our hope is to expand the frontiers of engineering education so these kinds of conversations can more readily be had within it.

We wrote the document iteratively and collaboratively in a shared document editor over the course of several weeks, both remotely and in-person. All three authors commented, edited, linked to external literature, and wrote their own statements in response to the evolving text. We often discussed and traded around who would “say” which parts: whose perspectives would be most relevant and powerful for the section at hand? At the end, we read through the paper together to make sure the writing reflected our thoughts and personalities. This means that while the document has three distinct and sometimes conflicting voices, it also reflects a collaborative process wherein our three voices shaped each other. We begin, in the next section, by introducing ourselves using this format.

### A. *Introducing the Characters*

**Lynn:** I am a professor of computer and cognitive science. I have been teaching for over four decades, nearly three of them as a faculty member, first for a decade at MIT and since then at Olin College of Engineering. During these years, I have mentored/supervised five postdoctoral fellows. Over my career, both my professional and my personal lives have included individuals with varying abilities, including several who are not hearing. Perhaps for that reason, I came into this story believing that I had a sense of what had worked for my students and associates in the past. Living these events has given me pause to reconsider questions I didn't ask at the time.

When this story begins, I was an Associate Dean at Olin for External Engagement and Initiatives. I supervised a small team with the rather large project of facilitating Olin's external engagement efforts. We were in desperate need of some historical sensemaking and evaluation around our work of the prior half-dozen years; we had committed to hiring a postdoctoral fellow to take on this project. Mel was an excellent candidate for the job. She had prior experience at Olin both as an undergraduate and later as a participant in and then researcher on Olin's external engagement efforts, so she was already peripherally involved in the work we were doing. During her PhD studies in Engineering Education at Purdue, she focused on the sorts of qualitative methodologies and sensemaking of complex phenomena we wanted to use as our starting approach.

**Mel:** I first met Lynn as a 17-year-old electrical engineering undergraduate at Olin. Back then, I vehemently rejected the idea of using disability accommodations, viewing them as a “weakness” and an affront to my teenage capabilities and independence (and, to be completely honest, pride). Like many deaf children, I had been raised by a hearing family in a hearing world without sign language. Growing up, I was repeatedly told my academic and career opportunities were due to my status as an “oral success,” which means being a deaf person who can “pass” as hearing through lipreading, speaking, and other means. It was strongly implied that being visibly deaf (or disabled) would limit my chances to learn the work I loved.

Because of this, I went through college and most of graduate school without requesting any accommodations. Instead, I developed coping mechanisms to hide my deafness. I

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<sup>1</sup> We acknowledge that some scholars of engineering education research the area of inclusive education or otherwise focus in disability studies. As important as that work is, it should not be the only area in which we benefit from scholars who happen to also have disabilities; nor is creating access the primary work even of most scholars whose focus is in disability studies.

BOX I. INTERPRETING 101

Interpreting is complex. English and American Sign Language (ASL) are different languages in the same way Spanish and Arabic are different languages. There is not a one-to-one correspondence between English to ASL. This means that in any given moment, the interpreter must be taking in what is being said, thinking about what it means and other details (how formal was the delivery, what is the speaker's intent, etc.), deciding how to convey it in ASL, and actually producing the signs.

Interpreters vary in their abilities to perform these tasks. The clarity and integrity of the interpreted message relies heavily on the interpreter's linguistic fluency and mental processing abilities, which can improve when working with familiar subjects. In turn, these aspects influence how a deaf participant can join the conversation. If an interpreter is unclear and the deaf person has to puzzle out what they are receiving, they have less time and mental capacity to think about what to do with the information.

would lipread in spurts to conserve cognitive energy, constantly search the internet for terms appearing in lecture slides to help me guess what my instructors might be saying in the lecture, did my homework early so I could barter homework help in exchange for other students telling me what had been said in class, and so on. I didn't sleep very much, but figured this was par for the course for an engineering student.

After college, I dove headfirst into the world of open source software and hardware, where distributed work environments made email and text chat standard communication tools. I slipped in as just another bright young engineer working remotely—on the internet, nobody knew I was deaf—and over time focused my work on bringing open source participation to university campuses. Eventually, this led me to Purdue's PhD program in engineering education. I hoped to learn the theories behind the learning approaches I saw in the open source communities I loved so much. I'd decided to focus on qualitative methods, feeling they were better suited to the complex sociotechnical learning that motivated my work.

In my first semester, a faculty member told me I couldn't do my own fieldwork because I was deaf. In response, I hurtled headfirst into postmodern qualitative methodology, where others were experimenting with radically rethinking what fieldwork, data collection, analysis, and so forth might mean. As an engineer and maker, I constantly spawned new tools and methods for keeping up in my coursework, carrying out my study protocols, and generally being allowed to exist in the world of engineering education research. As a deaf kid who'd never experienced a world that was already prepared for her to exist in it, this was all par for the course.

**Brittany:** I learned American Sign Language (ASL) informally while I was a teenager. The language fascinated me, and I became fluent fast. I started interpreting a couple years later and got my national certification about a year after that. My certification is proof that I meet the minimum qualifications to interpret, having knowledge of deaf people

and fluency in ASL and English. I will soon have been certified for ten years. [See "Interpreting 101" in Box I (above).]

Sometimes my work mostly goes from English to ASL; sometimes it goes in both directions. Sometimes I have a lot of background and context for the conversation I'm interpreting. At other times, I have a few lines of notes or, occasionally, nothing at all. The deaf people I meet are very different from one another in how they communicate, and I have to notice and adjust my own signing to match their language needs and preferences in the moment. Many times I show up once, interpret, and never see the same person in the same setting again. [See "Interpreting 101."]

I find my work more fulfilling when I am with the same person repeatedly. We can learn to work together, as a team, instead of me briefly supplying a service to strangers. I become more comfortable with the people and the environment, which allows me to hone the finer points of my interpreting.

*B. Assumptions We Brought*

**L:** After hiring Mel, I knew that we would have to think about accommodations, but I wasn't too worried. Part of that was also probably explicit extrapolation from an inappropriate model. While Mel had not used ASL as an undergraduate, I had previously worked with others who did, and the regularity with which interpreters appeared made it easy for me to assume that it was "being handled." My sense was strongly of an office, a process, and a structure that made at least the regular occurrences more a matter of course. In other words, based on my past experiences both with Mel and other deaf students, I assumed there was a working "turnkey" solution we would not need to worry overmuch about.

**M:** Similarly, I had started using my university's "turnkey" infrastructure to request ASL interpreting midway through my Ph.D. studies. It started with a dare from my classmates, who wanted me to participate in class discussions because I was particularly good at keeping up with our reading load. I told them I didn't know ASL, didn't need "support," and didn't really need course discussions to write my papers, but that for the sake of science, I would request ASL interpreting for a conference and prove to them it didn't help at all. My hypothesis was... incorrect.

**B:** I met Mel when she requested conference interpreters for the first time. I still remember how uncertain she was about me being there, and then, gradually, how excited. Afterward we kept in touch and worked together again. I learned more about her background and her discipline.

**M:** Over time, I started to explore and experiment more with different kinds of access. I chose realtime transcription as a method for my dissertation research because it made sense for the scholarship—my methods included a lot of *in situ* narrative analysis—and, as a side effect, was accessible to me. Brittany and I worked together several times at conferences, began to hang out as friends outside those conferences—we happened to be the same age—and then... Lynn asked if I wanted to move to Boston and become her postdoc. Eager for the apprenticeship, I immediately said yes.

### III. PART ONE: DESIGNING AN APPROPRIATE ACCOMMODATIONS SETUP FOR A POSTDOCTORAL FELLOW

**L:** Postdoctoral fellowships are often open-ended and ill-defined. Postdocs are junior research professionals. They conduct research, mentor students, may teach, attend meetings and acclimate to faculty culture, and are mentored by a senior professional. There is always a certain shaping of activities, roles, tasks, and projects to customize the opportunity to the individual. In this particular case, the postdoc project was especially early-stage and undefined. This meant that we expected, even more than usual, that our postdoc would be using early exploratory results to frame later questions and projects. As we will see later in this narrative, this fluidity of role would conflict with the rigidity of assumptions about disability accommodations.

**M:** Nobody at Olin knew what the position would look like, regardless of whether the postdoc was deaf or hearing. This meant that we also did not have a clear idea of what access for a deaf postdoc in that position would look like. My network of deaf academic mentors had told me that access for deaf faculty was both highly idiosyncratic and dramatically different from access in graduate school, so I figured that a postdoc would be a good venue for time-compartmentalizing access experimentation to see what worked for me. Postdocs are temporary positions by design, so I could learn at Olin and then use that insight to set up at my next institution.

**B:** Shortly after Mel was formally offered the postdoc position, we were all present at an engineering education conference where I was interpreting for Mel. Since we all knew Lynn would be Mel's postdoc supervisor in the near future, the three of us started discussing accommodation options.

**M:** There were multiple options to consider for multiple scenarios, and various combinations were possible. For instance, I'm skilled at lipreading and using my cochlear implant and hearing aids with small groups in quiet rooms for shorter periods of time. Reading realtime captioning on my laptop via a remote stenographer could be used for lecture-style setups where any changing of speakers (and thus microphone placement) would be both deliberate and rare. Text chat and email are accessible to me by default, and I've had many conversations in text chat while sitting next to the person I was "talking" to.

All of these were options, and we did use them all during the course of my postdoc. However, this still left the inevitable larger-group and extended-length interactions where being able to track a highly dynamic conversation through unexpected speaker switches, relocations, and so on would be vital to understanding: debate-heavy faculty gatherings, exploratory research team meetings, instructing students, and so forth. These are exactly the kinds of situations where professional ASL interpretation shines.

**B:** In my experience, most people don't consider the process of booking interpreters at all. [See "Hiring Interpreters," Box II, for a description of the process.] Lynn, and Olin as an institution, were about to be faced with the need to think about it a lot.

#### BOX II. HIRING INTERPRETERS

Hiring interpreters directly is a part-time job on its own. Someone needs to find potential freelance interpreters, contact those interpreters with information about the upcoming meeting, cross their fingers that one or more will be available, and then provide descriptions of the deaf consumer, location, and meeting content. All this needs to happen at least two or three weeks in advance. Since freelance interpreters piecemeal their schedules day-by-day, they are typically booked out that far ahead of time; for meetings with less than two weeks lead time, it's very difficult to find someone.

This is why many places use interpreting agencies. Similar to staffing agencies, they charge fees for coordinating interpreters and handling invoicing. The two week minimum lead time still applies, but at least the institution isn't expending so much time and resources on securing interpretation.

At the engineering education conference where I met Lynn for the first time, I explained some of options for hiring interpreters and the differences between working with traditional interpreting models and the Deaf Professional/Designated Interpreter (DP/DI) model [7]. I eventually described all of these models, their costs, and some of the tradeoffs involved in the report that I produced for Olin's Human Resources (HR) department during our first semester.

The DP/DI paradigm is an alternative to the traditional arrangements—such as those described in Box II—most frequently used for hiring ASL interpreters. Instead of freelancing with multiple deaf consumers, a designated interpreter (DI) works with a single deaf professional (DP.) The interpreter is always available, eliminating the need for two weeks' notice. The deaf professional's schedule becomes the designated interpreter's schedule. The interpreter handles other access requests as they come up, such as when a long day requires two interpreters, or when realtime captioning is the more appropriate access solution. This takes the labor of access setup from the deaf professional and allows them to focus on the job they were hired to do.

Mel and I had begun experimenting with aspects of DP/DI. We had already started leveraging my particular immersion in Mel's professional life to improve communication efficacy, and could see the results. I was becoming more familiar with the content of the conferences, which in turn improved my interpretation.

**L:** We had some wonderful conversations about what worked in different circumstances and what might be effective in Mel's new role at Olin. It was becoming clear to all of us that Mel would have at least *some* interpreting at Olin. After our discussions at the engineering education conference, we kept in touch via email and phone calls, where we raised the idea of Brittany coming to Olin alongside Mel as her designated interpreter.

### BOX III. LEGAL AND INSTITUTIONAL STRUCTURES

Most colleges and universities in the United States have established offices to provide access for students with disabilities (as required under section 504 of the Rehabilitation Act of 1973 and Titles II and III of the Americans with Disabilities Act of 1990, or ADA). Additionally, all but the smallest US employers similarly provide disability accommodations for employees, typically through their human resources offices. Those with 15 or more employees fall Title I of the ADA, which requires that they provide “reasonable accommodation” that does not pose an “undue hardship” for the organization. The “undue hardship” standard is typically applied to the employing organization as a whole and not to the specific hiring unit.

While educational accommodation processes are fairly mature, employment accommodation for academics is less so. For example, postdoctoral fellows are often recruited in the spring, to begin work at the beginning of the fall semester. In contrast, University budgets are typically built midwinter, with final budget approval taking place late in the spring semester and fiscal years starting mid-summer. Individuals are hired without regard to disability status — unless explicitly interfering with ability to perform required job functions, attention to such matters is generally understood to be illegal — and accommodations are developed only after an individual joins an institution. All this means that budgeting for accommodations is at odds with the academic hiring cycle.

### IV. PART TWO: LEGAL AND INSTITUTIONAL INFRASTRUCTURE

**L:** Early on, I think that I and Olin just presumed that accommodations were a solved problem. Adding to our confusion, there was no clear place to validate all of this; Olin had a centralized process in place for handling student accommodations, but lacked similar clarity for employees. Olin is a small college—we have fewer than 150 employees total—and Mel would be the third employee officially reporting to my very small external engagement group.

Over the months that preceded Mel’s start date, we began to realize that the problem remained unsolved. As an institution, this was new territory for us, and it felt like a big task with potentially meaningful budget implications. [See “Legal and Institutional Structures,” Box III (below).] For example, Olin had no disability-related budget or policies in place for employees. A new budget would not be created until that winter or enacted until the following summer, a full year after Mel began work. This meant we would need some rapid policy and process creation and some kind of stop-gap in the meantime. In engineering parlance, we had an emergent design project on our hands.

At some point, Olin’s HR office requested a breakdown of Mel’s schedule for an average week. Exactly how many hours of interpreting would be required, and when? At what times during the week would she be engaged in which activities? When would she be analyzing data on her computer? When

would she be talking with students? Which hours would be used for interviews? For mentoring? As anyone who has been a researcher knows, this is difficult to determine in advance, likely to change from week to week, and often most beneficial when serendipitous. HR was asking what seemed to them to be perfectly reasonable questions. They wanted to provide what Mel needed to get her job done. The problem was, these questions didn’t make sense for the kind of job that Mel was actually hired to do.

**M:** As an academic, I was used to answering whatever strange questions were needed in order to make my work possible. This felt like another grant application, IRB form, or course proposal; I rolled up my sleeves and started doing my best to answer the questions literally, as posed. Lynn had to stop me and point out that this was perhaps one occasion where I should not be quite so compliant with the process.

**L:** Instead, I suggested that we break down the kinds of work that Mel was expected to do: 20% archival research, data crunching, and writing; 50% interpersonal interaction (including interviewing, our meetings, student mentorship, and several other categories); and so on. Some of these things could be predictably scheduled, but others had to be either serendipitous or vary weekly. Also, some weeks might have a different balance of activities, but on average, this is how the semester was likely to go.

In an environment as fluid as Olin’s, for a new postdoc, on a project as dynamic as this one, building a schedule two or more weeks in advance — let alone one that could remain constant throughout the semester — was untenable. Mel’s schedule required heavy interpreting one week and light interpreting the next, and which weeks were which could not be predicted at the start of the semester. Any system of accommodations we set up would have to account for that.

**B:** This was incredibly illustrative of the differences between a deaf student and a deaf professional in academia. A deaf student would be attending lectures and labs at specific, consistent times. In a professional academic position, Mel did not keep a record of the exact hours she spent on each of her duties, nor should she have to, unless hearing faculty members were also required to keep timesheets for it.

**L:** We eventually got permission to try DP/DI for a one-semester pilot, during which time Brittany would also help evaluate needs, set up local connections, and work with Olin HR to create a longer-term plan. Since Olin’s budget was already set for the academic year, we identified a temporary funding source for the stop-gap semester. This was not the “proper” way to do funding: ADA guidelines treat disability accommodation as the responsibility of the employing organization as a whole rather than the specific hiring unit. Olin wrote the appropriate processes and policies over Mel’s first semester, including incorporating the requisite funding into the following year’s budget planning.

**M:** While Lynn and Olin worked out the institutional details, my start date came and went. I spent my first few weeks at Olin without interpreting or other access provisions of any sort. Unlike my student days, where I could compensate by reading my course textbooks, there were no “postdoc

textbooks” on how to navigate my new role, what my research project was, and so on. I tried to compensate by lipreading, moving as many conversations to email and text chat as possible, and constantly drinking caffeinated tea and doing calisthenics in an attempt to wring out more adrenaline for pushing through. Two weeks in, I was curled up in my office, miserably attempting to write in exhausted isolation, and trying pretty hard not to cry. This wasn’t how I wanted to start out my life as a junior scholar.

#### V. PART THREE: HOW IT WORKED (WHEN IT WORKED)

**M:** Once Brittany arrived, we developed a rhythm that worked for us. We kept a shared calendar and checked in about once a week about the next week’s rough schedule. I messaged Brittany about spontaneous interactions as they came up: “Lynn is free tomorrow afternoon for editing our paper; can you come to the office after lunch?” Sometimes we scheduled blocks that weren’t for specific meetings, but would allow me to spontaneously walk to a colleague’s office, be in my office for student drop-ins, or check out what the conversation in the staff kitchen was about without needing to rearrange everyone so I could lipread them.

**B:** When we needed to hire additional interpreters for meetings too long for me to cover alone, or times I couldn’t be on campus, I answered their questions so Mel didn’t have to. Eventually, we started a prep document that I automatically sent to every interpreter coming to Olin for the first time. It included practical information, such as: Mel voices for herself, meaning that she speaks instead of signing and having the interpreter voice what she is saying. The parking lot is on the left, and you don’t need a permit. When the word “Collaboratory” comes up, it refers to her work unit, and here’s how you sign it. These are all things that an interpreter coming to work with us for the first time would need to know.

**M:** Most folks at Olin were new to working with interpreters, but quickly adjusted to this as a new normal when working with me. On my part, it was also much easier to adjust to working with Brittany instead of an ever-changing parade of interpreters. Without the DP/DI setup, I would have had different freelance interpreters coming in for each meeting, and would have to re-explain and re-adjust each time. With it, we had the space to develop Olin-specific vocabulary, a shared understanding of my preferences, knowledge of each other’s favorite kinds of coffee, and the other little things that make extended collaborations work so well.

**B:** I became more and more comfortable interpreting for Mel. The more relaxed I was, the better I did my job, especially the aspects that weren’t... well, interpreting. For example, I could help others be comfortable with an interpreter present by being friendly before and after Mel’s conversation. I could convey the subtleties of their tones and word choices more clearly while interpreting because I wasn’t using mental energy to figure out the speaker’s basic meaning. I didn’t need to ask Mel if she wanted me to interpret or not, because I could read the situation and make the appropriate call.

**M:** Sometimes not having interpreting was what I wanted, and it was important to have those choices too. For instance, some one-on-one research conversations with long-time

colleagues flow more quickly when we’re on our own at a coffee shop or at someone’s house working late into the night. If a student comes in looking close to tears and seeking advice, I might choose to lipread that conversation, even if that rapidly makes me tired. However, lipreading insurance spreadsheet discussions at a faculty meeting is a poor use of my brain.

**L:** The systems that we put in place largely allowed Mel to do the job we hired her for. She was able to conduct interviews and fieldwork; evaluate our programs; produce papers; collaborate with others; lead and participate in a range of professional development and mentoring activities. Crucially, she was also generally able to do this without expending unreasonable amounts of energy on interpreter scheduling, lipreading complex group discussions, or other activities that would have made her substantially less productive at the work for which she was hired.

Over the first semester of Mel’s postdoc appointment, Olin’s HR office also developed a set of policies and procedures around this topic. For us, this meant that Brittany continued working with Mel under the DP/DI model. For Olin, the approval of these policies means that when the next college employee requests accommodation for a disability, there will already be a process in place. It will be clear to whom the request should go; processes for identifying needed resources will exist; and there is now a line item in the College budget so that necessary payments can be made. This won’t ensure provision of the accommodation—details need to be customized—but at least we’ll know where to begin.

#### VI. PART FOUR: LATHER, RINSE, REPEAT

**L:** We had come up with a working system and started getting used to it, but we were not finished. No sooner had we settled down to do the good work Mel’s access enabled that we’d find there was some new variant not covered by the existing processes or some reason why they needed to be reexamined.

**M:** For instance, new opportunities popped up, like the chance to collect observational and interview data at a partner university in Texas. A hearing researcher would just... go. But me going? That was... expensive.

**B:** Who was supposed to pay for access, Olin or the partner university? Who would interpret, and how would we make sure the quality of access would allow Mel to collect high-quality research data? If I looked for local interpreters in Texas, how would we know whether they could handle the job? If I went along, should Olin pay my travel too? What was the best option for Mel, and was it cost effective?

I called Texas interpreting agencies, spoke to the owners, got quotes, and ran the numbers. I first estimated the number of hours Mel would need interpreting services each day, and then asked for the agencies’ hourly rates for interpreters. Then I considered my schedule and estimated travel costs. Once HR had the information, it was clear that covering my travel was the most effective way to handle this part of the project. Gathering all that information took me several hours over about a week’s span, and that work was needed because there

was no precedent for that decision at Olin. We were making it up as we went along.

Even the system we had worked out at Olin needed to be re-explained when new people encountered it. In the summer between Mel's first and second years at Olin, HR went through some personnel changes. The new person assigned to our situation asked for a re-evaluation of access needs, and we had to go through the same questions all over again. It eventually turned out that the document I had written the previous year had not been passed on to the new person.

**M:** In the meantime, I once again started the school year with no accommodations. There was clearly no ill-intent, but I don't think people realized how heavily this would impact us. We hadn't thought to specify that, in the event of a re-evaluation, the current accommodations setup should continue until the re-evaluation determined a different setup. Instead, in the entirely appropriate cause of "good stewardship," I had no access to my job, Brittany had no job, and Lynn effectively had no postdoc during the multi-week re-evaluation.

Another occasion that emphasized the difference between access for undergraduate/graduate level work and postdoctoral/faculty level work was my first invitation to serve on an NSF review panel. I was fortunate to have a supportive Program Officer who knew I would have access needs ahead of time. They made it clear they were willing to advocate for whatever needed to happen. I was once again an unexpected perturbation to an established system.

**B:** The NSF had experience hiring interpreters for panelists, which came as a huge relief. They already had a system in place for doing so. However, within the system, Mel hit some walls: they did not have a precedent for a deaf professional wanting to use interpreting outside the hours when the panel formally convened, and they did not have a precedent for a deaf professional wanting to bring in or request specific interpreters outside of the locale.

**M:** For interpreting outside the formal panel hours, we argued that other panelists frequently talked with each other over lunch and gathered for dinner, and that this was an expected part of the NSF service experience. Without interpreting, I would miss out on the semi-formal networking and subsequent career growth that a hearing scholar in my position would have.

I also wanted to request specific interpreters ahead of time because we knew the level of discourse at an NSF panel would be intense and rapid-fire, with plenty of transdisciplinary and highly specific vocabulary. Most interpreters can handle undergraduate-level classes just fine, but that doesn't mean they can keep up with a room full of PhDs. If the interpreters they happened to book didn't work out for my needs, I'd be stuck, and would actually end up worse off than if I hadn't requested access at all. When I know I'm on my own for communication at an event, I plan for things to be hard. I scale down my goals accordingly, line up back-up support from hearing allies, and so forth. However, when I expect to have access, I schedule conversations and meetings under the assumption that I'll be able to freely communicate. If I find upon arrival that my assumptions were incorrect, I then need to

do some combination of exhausted powering-through while missing most of the conversation, plus cancelling with apologies to busy people I might not have the opportunity to talk with again for another year or two.

Suffice to say, I didn't want to take my chances on this for my first NSF panel. Brittany and I drafted an email to the Program Officer, and Lynn phoned the NSF shortly thereafter.

**L:** It turns out that NSF was perfectly willing to do this, but the officially sanctioned process required more lead time than the panel's rapidly-approaching date permitted. What eventually unlocked the system was a combination of NSF personnel willing to listen and to think creatively *within* the existing rules and regulations; a deaf professional and designated interpreter able to lay things out clearly; a Program Officer willing to go the extra mile to enable his panelist to bring her full self to the task; *and* a phone call from me—a reasonably neutral senior academic with plenty of NSF experience and empathy for those charged with keeping the rules — to help connect the dots that each of these individuals had set out.

## VII. PART FIVE: GRACEFUL AND NON-GRACEFUL FAILURE MODES

**M:** Even when we had interpreting up and running, no system operates reliably 100% of the time, and this was no exception. In software engineering parlance, what would we do for error handling?

One incident came up when well-meaning people with different vantage points and goals tripped over one another in unexpected ways. Brittany and I were assigned to a shared office that had previously been used by visiting faculty who rotated in and out every semester. The furniture was semi-standardized to ensure that anyone assigned to the space would likely find what they needed there. Olin doesn't have a lot of spare furniture or spare space, and that office had been relatively unchanged for years.

**B:** It was sliced into pieces by two almost floor-to-ceiling bookshelves. The bookshelves made sense from the perspective of a shared office space; it created a visual barrier that carved out separate spaces for multiple occupants. Unfortunately, when your communication modality depends on sight, visual barriers become communication barriers. We couldn't communicate to each other in our own office unless we went and stood in very specific pairs of spots in the room.

**M:** We removed the bookshelves, replaced them with a couple of waist-high ones from my apartment, moved the offending bookshelves to a wide hallway where they wouldn't obstruct anything, and requested that facilities take them from there. We didn't anticipate the trouble this would cause.

**L:** There's a protocol for these things. Facilities has processes, and the administrative assistant in charge of the space saw Mel and Brittany doing unprecedented things. The quick fix rearrangement made perfect sense to Brittany and Mel, who were setting up a usable working space with good sight lines for ASL. To them, the bookshelves were an active blocker to the basic functioning of their jobs. To someone

unacquainted with this reasoning, it looked like they just couldn't wait for things to be done according to process. This was one example of multiple small places where Olin's institutional protocols, created for other quite reasonable purposes, collided with Mel's access needs. The misunderstandings were eventually sorted out, and the bookshelves were relocated elsewhere.

**B:** There have also been times where we have mistaken the intensity of the work day or the length of a meeting. Mel and I are both on the high end of the endurance spectrum, but we have our limits, and sometimes we realized too late that a situation really required more support.

**M:** We've miscalculated and worn you out, and I've had to convince you to take breaks while I plunged in alone to lipread, which wears me out. I've miscalculated on days I thought I wouldn't need support for interactions, worn myself out, and been a poor colleague that day because of exhaustion.

And then there were times when the system simply failed, and we had to improvise. In my second semester, we had a faculty meeting where no interpreter, including Brittany, was able to make it. Several of us—myself, Lynn, and three other hearing colleagues—decided to try the experiment of “what would it look like if Mel's communication was community-supported, instead of hiring a professional to take much of the load?” This meant that all five of us opened a shared document and collaboratively transcribed the meeting in real-time; I filled in things like contextual information for the slides (since the spoken words would often refer to things on the screen, and the transcript made no sense without it) and correcting spelling, and everyone else worked to keep up with the speaker.

**L:** This was an interesting experiment, and it helped us all to understand the difference between minimally rendering the meeting legible and genuinely providing access. We get far more from Mel when we afford her full participation, which means hiring professionals who can provide her with full access to the conversation, and us with full access to Mel.

**M:** We did a decent job of providing a transcript, and there was some fascinating backchannel commentary on both the faculty meeting and the process of transcription. However, all of us were wiped out by the end of the roughly 1-hour meeting portion of the 2-hour gathering, and none of us had participated in the meeting itself—the energies of four employees were sucked into providing partial, high-effort access for one. This was clearly not a sustainable solution.

### VIII. DISCUSSION AND CONCLUSION

In transitioning from three separate narrating voices back to a single unified one, we want to highlight and expand on several themes woven throughout this case study. First, professional/scholarly work is not the same as undergraduate work, and it requires a different set of approaches to most everything, including disability-related accommodations. The fluidity of most research/scholarship-based roles creates new opportunities for institutions and for professionals in these roles. That same fluidity can also be an obstacle for existing solutions designed around different roles. Institutions that have turnkey solutions for undergraduates or administrative jobs

may find themselves inventing new processes for senior graduate students, postdoctoral fellows, and professionals. In some cases, the existence of solutions (undergraduate disability services; visitor accommodations; access for employees in more predictable jobs) may even complicate the establishment of more dynamic processes.

The three of us grew through these experiences, and we believe we are now better equipped for our next encounters with these issues. We are also confident that the next experience will require similarly individualized and customized solutions. Engineering education scholarship is a complex, specialized field. Supporting one individual engineering educator with their particular set of accessibility needs is a good formula for, well, supporting one individual engineering educator with their particular set of accessibility needs. Even for the same person at the same position in the same institution in a relatively short period of time (2 years), new venues and situations required us to revisit the options, educating new partners and sponsors, and creating new machinery and mechanism. Disabled scholars and their colleagues should expect and embrace constant experimentation with accommodations as a part of the constant experimentation with new ideas inherent to all scholarly jobs.

Nonetheless, the processes by which we came to these solutions might be instructive to a more general audience. As with many research discoveries, we did and made and learned many things precisely because existing off-the-shelf models did not work for us. We explored and experimented and created and collaborated in ways not unfamiliar to engineering teams building solutions in a complex world. By framing our stories of accommodations development in similar ways, we hope to encourage others to experiment with how the models they choose can influence how they approach these situations.

We also emphasize—and hopefully model—the importance of treating this job as one requiring the full participation of a multifaceted team. It's important that the effort not fall disproportionately on the shoulders of the disabled scholars themselves. Being a Jackie Robinson is exhausting; disability labor can constantly feel like being forced into the maintenance/janitorial crew for the great big fun makerspace of engineering education when one would rather play other roles [8]. Without collaborators and allies, both disabled and non-disabled, this terraforming is impossible.

Even with allies, it is exhausting work, and it detracts from other important work that engineering educators and scholars have to do. We believe that disability labor and engineering education work are not two separate things, and we also believe that engineering educators who are disabled should be able to choose how much, and what kinds, of disability-related labor they want to do. When these scholars are forced to constantly devote a fraction of their effort to the administrative tasks of restructuring their environment to make their core work possible, they have less capacity to do that core work. The more we are able to streamline this effort, the more benefit we as a community will receive from the full participation of all the people who might choose to contribute to our world.



## REFERENCES

- [1] E. Steinfield and J. Maisel, *Universal Design: Designing Inclusive Environments*, Hoboken, NJ: John Wiley & Sons, Inc., 2012.
- [2] R. E. Stake, "Qualitative Case Studies," in *The SAGE Handbook of Qualitative Research*, 3rd. ed, N. K. Denzin and Y. S. Lincoln, Eds. Thousand Oaks, CA: SAGE Publications, 2005, pp. 443-466.
- [3] H. Chang, F. W. Ngunjiri, and K.-A. C. Hernandez, *Collaborative Autoethnography*, Walnut Creek, CA: Left Coast Press, 2013.
- [4] N. W. Sochacka, K. W. Guyotte, and J. Walther, "Learning Together: A Collaborative Autoethnographic Exploration of STEAM (STEM + the Arts) Education," *Journal of Engineering Education*, vol. 105(1), pp. 15-42, January 2016.
- [5] J. D. Thompson, M. Chua, C. H. Joslyn, "Engineering and Engineering Education as Spiritual Vocations," *ASEE Annual Conference & Exposition*, Indianapolis, IN, June 2014.
- [6] J. S. Bruner, "The narrative construction of reality," *Critical Inquiry*, vol. 18(1), pp. 1-21, 1991.
- [7] P. C. Hauser, K. L. Finch, and A. B. Hauser, *Deaf professionals and designated interpreters: a new paradigm*, Washington, DC: Gallaudet University Press, 2015.
- [8] M. Chua, "The Privilege of Being Oblivious," *ASEE Prism*, September 2015.