

Article

Putting Inclusion into Practice: Five Commitments Toward Equity in Teaching

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Abstract: Instructors make day-to-day decisions grounded in their own experiences, and this practice may be appropriate for the students who share similar experiences and backgrounds. But for students who come from a different socioeconomic status, nationality, racial or ethnic identity, gender or sexual identity, or ability status, the instructor's experiences may be insufficient to provide guidance for how to create an inclusive space for all learners. This manuscript describes interviews collected with students with disabilities regarding their experiences having their disability accommodations implemented in their courses. From these interviews and personal reflections on teaching, the author piloted and refined several teaching practices to improve the accessibility and inclusion in her own classroom. The author summarizes the principles underlying these pedagogical decisions as five commitments toward equity in teaching.

Keywords: action research; qualitative research; diversity; equity; inclusion; accessibility; disability; large lecture courses; science education

1. Introduction

You are halfway through the riveting (or so you thought) lesson that you prepared when you look over and see a student with their elbow propped on the desk, chin in hand, head lolling as they struggle to stay awake. A few minutes later, you glance in their direction again and notice they are clearly out. What do you do next?

- (a) Wake them up and tell them they need to relocate because your classroom is not an appropriate place for napping.
- (b) Wake them up and make a joke about it to cover up any awkwardness.
- (c) Continue with the lecture without taking any action.
- (d) Continue teaching, but then contact them afterward to see if everything is ok and if they were able to obtain satisfactory notes from a friend.

The course of action that you take is dependent on your goals and experiences. Humans, even professors, are logical creatures who pursue actions that they believe best align with their goals. In this article, we will assume that professors hold this goal in common, to facilitate the learning of each and every student in their classroom, and that the actions they take are in pursuit of that goal. This begs the question: How do professors choose the actions that are most likely to facilitate learning for all students?

Teachers tend to make pedagogical choices that are familiar to them, e.g., those that correspond to their experiences as students, teachers, or researchers (Oleson & Hora, 2014). For the students who have different traits, backgrounds, talents, and ability status than their teachers, those pedagogical decisions may fall short in supporting their learning. Therefore, teachers need to cultivate knowledge of students who are not like them to cultivate practices that will support those diverse students.



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One potential area for mismatch between instructors' and students' experiences is in disability status: only an estimated 4% of university faculty members are disabled (Grigely, 2017), while students with disabilities make up nearly 20% of the undergraduate population (National Center for Education Statistics, 2023). Disabilities can be wide-ranging in both the way they impact a person and the degree to which a person is impacted. There are many categories of disability, such as physical, such as limb differences; cognitive, e.g., dyslexia; or emotional and behavioral, e.g., panic disorders. Disabilities may also be apparent to an observer, or they may be invisible. They may be temporary or chronic. The diversity of students' experiences with disability indicates an urgent need for faculty to learn more about various ways students may be impacted by disabilities, so that instructors are better equipped to meet students' educational needs.

When a student with a disability (SWD) matriculates, they must decide whether to disclose their disability(ies), navigate the process for receiving accommodations, and then implement those accommodations throughout their academic career. While there are several studies that explore the students' experiences throughout the first steps in the process (Ben-Simon et al., 2008; Cole & Cawthon, 2015; Harrison et al., 2013; Lightner et al., 2012; Lindstrom, 2007; Lovett et al., 2015; Salzer et al., 2008; Stevenson, 2010; Storrie et al., 2010), and the resulting academic outcomes for those students (Abreu et al., 2016; Blasey et al., 2023; Hollins & Foley, 2013; Nielsen, 2001), there is not much information about the interactions between the student and their instructors regarding the specific implementation of the accommodations. Therefore, the research questions guiding this article are as follows:

1. What are the experiences of students who try to implement their accommodations in individual classroom environments?
2. How can knowledge of student experiences inform and transform teaching practices?

2. Materials and Methods

The first research question was investigated by conducting interviews with SWDs according to a protocol designated as exempt by Grand Valley State University's Institutional Review Board (22-305-H-XXXX). The student participants were recruited by email through the university's Disability Support Resources (DSR) office at a large, public, primarily undergraduate institution in the Midwestern United States. Four students accepted the invitation to participate in semi-structured interviews ranging from 50–80 min in duration (Table 1). Interviews were conducted by video conference and transcripts were refashioned with narrative analysis and the resulting narratives were validated by member-checking with the interview participants (DeKorver et al., 2024). Themes from the narratives were discussed among researchers DeKorver, Brown, and Witcher, who brought a diversity of perspectives to the analysis. Brown was a former student of DeKorver, who upon learning about some of the struggles his peers with disabilities faced, approached DeKorver about the possibility of conducting research in the area. As an undergraduate researcher, Brown was the primary interviewer, as it was determined that a peer would be more well suited to elicit student experiences. Brown was also able to provide valuable perspective throughout the analysis, which heavily relied on interpreting the dynamics of student–instructor relationships. Brown and DeKorver recruited Witcher, the director of the Disability Services Resource center, to complete the research team. Witcher's role was to provide additional context and perspective on the process of student accommodations, as well as keeping the research findings grounded in the experiences of people with disabilities and minimizing unintended ableism and tokenism.

Table 1. Summary of SWDs interviewed about their experiences having accommodations implemented in their courses.

Pseudonym	Demographics	Necessary Accommodations
Lacey (she/her)	STEM major in her 6th year	extended time on assessments and student note-taker
Katie (she/her)	STEM major in her 4th year	extended time on assessments and student note-taker
Deb (she/her)	STEM major in her 3rd year	extended time on assessments, recorded lectures, instructor’s slides in advance
Pam (she/her)	Humanities major in her 3rd year	closed captioned lectures

The data from this study were analyzed from a social model of disability (Shakespeare, 2006), which challenges the notion of disability as a personal characteristic and places the responsibility of dysfunction on existing social structures instead of on the individual. This suggests that university and course structures should function for students of all abilities, without the need for individual accommodations. However, DeKorver reflected that her course roster regularly included 5–10 students each semester who required accommodations to participate in her classes. This led DeKorver to scrutinize her own teaching practices through the social model of disability, documented through reflective memoing. These writings were inspired by critical reflection, where instructors examine their pedagogical practices through the lens of ethical considerations such as equity and inclusion, but also consisted heavily of deliberative reflection, weighing the practical considerations of instructor, student, and institutional needs (Larrivee, 2008; Valli, 1997). Her goal was to restructure her course policies to create greater equity in student learning outcomes and provide a more inclusive learning environment. This desire coincided with the exigencies of revising courses to respond to the COVID-19 pandemic, allowing much more freedom, motivation, and opportunities to implement drastic changes in course structure.

The courses undergoing these changes consisted of four different 100-level chemistry courses. Three of the four courses were a combination of lecture and laboratory sessions; the courses ranged from three to five credits (Table 2). Each class section enrolled up to 90 students, primarily students majoring in STEM fields, and [Redacted] taught some combination of two sections of these courses each semester as these changes were implemented during a time frame spanning from 2020 to 2024. After the initial changes were implemented, course data were reviewed to evaluate and inform further refinements. These data included end-of-term grades, mid-term and end-of-term student evaluations of teaching, degree and frequency of student accommodation requests, subsequent course grade outcomes were reviewed, and the experiences of faculty teaching the courses. Adjustments to course policies and the implementation of new policies continued in subsequent semesters based on the most recent data according to principles of action research (McNiff & Whitehead, 2002). Because this research was grounded in personal reflections and decision making, the results and discussion are reported in the first-person voice.

Table 2. Courses included in action research portion of this research.

Course Title	Number of Course Credits	Maximum Student Enrollment Per Section	Curricular Requirement for Majors and Programs
Preparatory Chemistry	3	20	not required
Introductory Chemistry	4	96	nursing, wildlife biology, allied health science, medical laboratory science, physical science general education
Principles of Chemistry I	4	66	chemistry, biology, pre-med, biomedical sciences, engineers, geology, physical science general education
Principles of Chemistry II	5	52	chemistry, biology, pre-med, biomedical sciences

Limitations

The interview data were collected from a relatively small number of participants. The experiences of this subset of participants cannot encompass the vast diversity of disabilities that impact students' education. In addition, all participants had similar racial, ethnic, and gender identifications, which further limits the diversity of the sample. As a student's other identities intersect with their identity as a person with a disability, this may lead to an even greater diversity of experiences that are not captured among these data.

3. Results

3.1. Classroom Engagement

Many instructors regard taking notes as quintessential to a student's engagement in the classroom (Wong & Chiu, 2021). Yet there are a variety of disabilities that act as a barrier to participating in this activity for students. Kate described her efforts to join in the practice of note-taking: "I take notes on literally everything because I can't tell what's important or not. I'm not very good with tone". It was difficult for Kate to interpret which points during her professors' lectures were salient, so try as she might, her own note-taking was not contributing to her learning. Kate's accommodations stipulated that the professor should recruit a note-taker to provide her with class notes. (Other institutions may have different policies and practices about providing accommodations but at this institution, the instructor is tasked with recruiting a note-taker). While this accommodation was useful when it was carried out, Kate found it difficult to have this implemented in all of her classes. Lacey faced a similar struggle in having her note-taking accommodation met, although her note-taking obstacle was related to a physical disability rather than cognitive.

Lacey: I generally have had trouble with receiving a note-taker. Professors ask for volunteers to take notes, but often no one volunteers. I think maybe because it's unclear what the notetaker does, and no one knows what to do next.

Lacey resorted to asking her friends to take notes or taking photographs of the classroom projector screen and described these measures as inadequate. Deb, who did not have note-taking accommodations, attempted to aid her note-taking by taking photographs during a class and expressed her frustration at the outcome.

Deb: One time a professor called me out for taking a photo of a slide during class. "Hey, no taking pictures!" I had stitches in my right hand and couldn't write with it. I didn't have an accommodation for that because it was a temporary injury. I tried to write with my left hand, but was struggling to write legibly. It makes sense why they don't want us to take pictures, but I think sometimes students just struggle to write everything down. If they don't want us to take pictures, is there something else that they can do to help us? It would be nice if they could meet with us in office hours and find a way to make it work so that we don't break the rules or inconvenience them, but we still get what we need.

Deb wished that her professors would provide a way for all students to have access to notes. Lacey, who was unfamiliar with Deb's account, made the same point.

Lacey: Even when the professor sends me all the slides, it's not as good as having notes, and when it comes time to homework or studying, I don't have adequate reference material to guide me. I think it would help if professors made their notes more available, for all students regardless of their DSR status.

Kate had a professor who did make the notes, taken by a volunteer student note-taker, available to the entire class, saying, "She had a student anonymously take notes for us, and the notes were available to everyone. So not just me, not just another student who has a note-taking DSR memo, but everyone. And that was really helpful". The fourth

student participant in this study, Pam, also made this recommendation, “I would rather that professors just have [lecture notes and slides provided] as part of the normal routine. It definitely helps me, but it would help a lot of other students, too”. Even though these students had drastically different disabilities, each was limited by their note-taking and by the lack of accommodation, and each felt that note-taking should be more accessible for their able-bodied classmates, as well. I agreed with the points these students made and felt that I should be doing something to support note-taking, but I was not sure how to implement it.

My initial instinct was to de-emphasize note-taking in my classroom. Many instructors eschew lectures in favor of active-learning pedagogies. In these, the course is structured so that students frequently work together in small groups (e.g., flipped classrooms (Seery, 2015), cooperative learning (Bowen, 2000), and POGIL (Moog & Spencer, 2008)) rather than sitting and taking notes. Yet these forms of engagement are also not possible for some students with disabilities without accommodations or additional scaffolding. Students with clinical anxiety, an increasingly common condition among college students, may find their symptoms exacerbated by these sorts of activities (Cooper et al., 2018). Although the participants in this study did not specifically talk about group work, they did talk about their perceptions of their peers. Kate, who was diagnosed with autism, said she felt awkward around others, and that sometimes she perceived negative attention from her classmates: “it feels like everyone in that room knows she’s got something going on up there”. She also related that in one particular class, a group of classmates “made fun of me” and “kept a tally” of her interactions with the professor. Mandating that all students work with their peers and grading them on these efforts creates a situation that exacerbates existing inequities.

Furthermore, my reflections revealed that students had to be physically present to receive credit for participating in the in-class group activities. Classroom response systems or “clicker” are a popular tool for ensuring attendance and participation in active learning classrooms (Gibbons et al., 2017); I either used clickers or group worksheets to document students’ attendance in my lectures. I found I was increasingly uneasy about awarding credit for in-class activities knowing that some of the students who provided DSR memos needed accommodations for frequent absences. I began to consider alternatives so that my course grades were less dependent on physical presence during scheduled class sessions.

I was able to address the accessibility of all three trouble areas (note-taking, group problem solving, and in-class attendance) by implementing one new course policy. I created an assignment category called “Community Learning” to replace the grades students had previously earned through group work and attendance. Community learning (CL) occurs throughout the semester and students are able to choose how they want to engage in CL. They may decide that they will share their notes on the class discussion board, participate in in-class discussions, form a study group, or provide a summary of class for a classmate who was absent from a session. They could create practice questions and post them to the class website. They could ask or answer questions on the class discussion board. I even encouraged them to facilitate virtual attendance for classmates who could not be physically present but still wanted to engage via video or teleconferencing.

Activities are valued as CL when they (1) are accessible to other classmates, (2) require sustained effort, (3) are a unique contribution, and (4) impact the student’s own learning. Not every activity scores highly on all criteria. Posting notes for all to see is very accessible, but it likely would not impact the student’s learning as much as hosting a review session for a small study group (which would rate as less accessible). Students assess themselves eight times throughout the semester on a rubric (see Figure 1) to earn points. The number of points required to earn full credit for this assignment category is much smaller than the

number of points possible; that is, students can earn 100% of the points in this category even if they do not earn 100% each time they self-assess. During the first semester of implementation, I learned that students were surprisingly honest in their self-appraisals, and they chose a great variety of ways to contribute to CL. There was a healthy level of activity on the course discussion board, a wide variety of notes were promptly available after every class session, and there were robust study groups. I felt like this solution balanced my desire for students to practice communicating with others to build knowledge with the students' needs for autonomy and accessibility.

My community learning for this Learning Objective...	Rating 0: not true 1: somewhat true 2: very true
...was accessible to a wide variety of my peers.	
...provided a unique contribution to the class.	
...improved my knowledge of the LO.	
...required effort throughout the duration of the LO.	
total	

Figure 1. The rubric for community learning as it appears in the course assignments.

3.2. Assessments

Perhaps unsurprisingly, the participants placed the greatest emphasis on how their disabilities impacted their completion of tests and quizzes, the portion of their classes that most heavily impacted their grades. Their accommodations for testing included stipulations for extended time, a quiet testing environment, and the ability to wear headphones. Unfortunately, the enactment of those accommodations sometimes negatively affected their ability to participate in other typical class activities.

Katie: Even though I got [testing accommodations] eventually, my professor made it a hassle. After that I interacted with the professor differently, I usually go to office hours. I love them. I live off them. But after that, I never went to that professor's office hours. I felt more comfortable missing class and I didn't really want to go. I lost a little respect for the professor.

Lacey: Early in my college career, I had one professor who was very reluctant to give me extended time on tests. The class began with a quiz followed by lecture. She would have me leave the class to take the quiz, which cut into my class time, and made me miss the start of lecture.

Katie and Lacey both missed out on other expected course activities due to the way their accommodations were implemented.

Some students' accommodations allow them to take the exam in a quiet area with minimal environmental distractions. These students are still able to choose this option by scheduling a proctored exam with our DSR office. Other students, preferring to remain in proximity to the instructor, rely on technology such as headphones to minimize distractions. Katie was one such student.

Katie: The only time I've felt singled out truly though was when I wasn't allowed to wear AirPods, and I have AirPods because: One, they are noise canceling which is fantastic; Two, they're really really low key, so you can fit them in your ear, and no one knows. I had a professor that was really uncomfortable with it because they're Bluetooth and they connect to my phone. So, I have a second set of headphones and it looks like I'm working in a construction yard when I wear them. They are huge. . .It's the only time where I truly felt singled out when it comes to accommodations.

Even though Katie's accommodations specifically permitted her to use headphones, her instructor placed restrictions on the type of headphones she could use, making her self-conscious about her use of the accommodation.

Deb's account illustrated the challenges for students who have anxiety, but for whatever reason, do not have accommodations for it.

Deb: That first semester I had a panic attack during my exam. I had been getting a B in that class, but I failed the exam because I only filled in three answer bubbles, and there was no option to retake it. The professor couldn't do anything for me they said, because I did not have those accommodations. I might have passed that class the first time around if I had a DSR memo. It's just helpful to have a back-up plan so that the anxiety doesn't keep building as you try to figure out what to do about it.

When students suffer from test anxiety, they are unable to demonstrate their knowledge. Yet, course assessments purport to be an accurate measurement of students' knowledge. If an analytical chemist discovers there is an environmental factor producing interference in their measurements, they do everything they can to reduce or eliminate that factor in order to make their measurements more valid, i.e., the measurements are only influenced by the factor(s) that they purport to measure. Therefore, to maximize the validity of our assessments, we should be doing all we can to minimize interference from student anxiety.

From the instructor's standpoint, we have to contend with the reality of physical limitations of time and space when meeting accommodations for assessments. My strategy to address this conflict was to radically revise my assessment strategy. I began by shortening my assessments to only one question for each stated learning objective. My mid-term exams went from 25 to 40 questions for a 50 min testing period to 3–15 questions (depending on the level of granularity of the learning objective and the type of assessment item). This meant that most students completed the exams within more than half of the time remaining in the class. This also meant that for the last 30 min of the exam period, the remaining students had a silent, nearly empty lecture hall in which to complete their work. Many students preferred to remain working for the entire 50 min period. I discovered that a few students wanted even longer to work, and because I taught two back-to-back sections of the same class in the same room, I was able to facilitate this. Students who wanted more than 50 min could begin their test in the first section and remain through the second section. One time, a student wanted additional time on a particular assessment, but their course schedule did not permit them to attend both sections; we were able to work out a different, mutually agreeable arrangement. I went from scheduling exam accommodations for 5–10 students at each exam to one instance of accommodation that entire semester. In

addition to the convenience these exam modifications afforded me as an instructor in nearly eliminating the need for individual accommodations, students appreciated the emotional benefits of having extra time, expressing that it relieved their symptoms of test anxiety.

In addition to mental health issues, there are other chronic medical conditions that might be interfering with my students' ability to take exams. For example, I have taught students who were dealing with chronic migraines, Chron's disease, endometriosis, and ankylosing spondylitis. I did not want to assign a score of 0 if their symptoms prevented them from attending a scheduled exam; I wanted their score to be an indicator of their learning rather than their health. Yet in a large lecture course, scheduling make up exams would be prohibitively challenging. To solve this issue, I moved to a standard-based grading format, where each exam is given multiple times throughout the semester and students can earn full credit even if they are absent (or fail) the first attempts (Talbert & Clark, 2023). The shorter format of my exams meant that writing and grading multiple iterations of the exams did not impose additional hardship on me. Implementing these additional assessments in person does require extra course time; I made room for this in the course schedule by recording videos of some of the material that I would have covered by an in-class lecture. These videos were assigned to students to view as homework in the course learning management system, similar to the distribution of content in flipped instructional methods (Seery, 2015).

Another way to make classroom assessments more valid would be to make sure they ask students to demonstrate the knowledge and skills expected of practicing scientists (Stowe & Cooper, 2019). The primary mode of assessment for burgeoning scientists is through summative exams, yet practicing scientists do not take written exams as part of their professional activities. This means that we are evaluating students' science knowledge and skills by a metric that is not authentic to the work of real world science—again, a threat to the validity of our assessments. Katie recognized this weakness.

Katie: "Another one of my math classes was based on portfolio style homework. So this portfolio style way of doing things had no quizzes, tests, or things like that, and the homework is optional, only turned in for feedback. We do check-ins. Like "How's it going? What do you need from us that you need to be successful? What can we do to help you?" I appreciate every bit of that. What they "grade" if you will, is the portfolio you create of all these math problems that you do. I knew early that I didn't need my DSR memo because it wasn't that kind of class. At the end of the semester, I asked for an A and I got an A, because my portfolio was good. It was the professor's philosophy that this method of teaching better prepared us for the real world. There are no timed tests and graded assignments in the real workforce. There are projects and problems you work on and receive feedback. You should be prepared for that".

In Katie's math class, the portfolio assessment allowed her to showcase her understanding, as well as developing the "soft skills" of working on a project throughout the semester, making continuous revisions after feedback. This flexibility that this type of assessment allows is much more accessible and, as Katie points out, is more aligned with the types of tasks students will be expected to perform in a professional setting. Unfortunately, I have not reached that level of authentic assessment in my own teaching, although it remains one of my goals as I continue to revise my teaching methods and materials. One way I have sought to make the evaluation process more authentic while remaining in the framework of exams is by writing assessment items that require students to use their knowledge to engage in science practices such as drawing conclusions from data or using models (Stowe & Cooper, 2019). Another strategy I have employed is to allow students to use reference material on their assessment, ranging from a relatively paltry notecard measuring 3 inches by 5 inches to including fully open notes, open textbook, or

even allowing them to use online resources. After all, practicing scientists are generally permitted to use references in order to solve the tasks set before them.

Additional details about the course policies I have enacted are provided in the Supplemental Information. Table 3 summarizes the key classroom policies that I revised in the semesters following the transition to remote teaching in 2020 and the subsequent transition back to face-to-face instruction. Over this period, the proportion of my students formally disclosing their disabilities has dwindled to about 1% each semester, and these remaining students have indicated they were disclosing their disability status in an effort to provide me with information, but did not need me to take any further action to meet their necessary accommodations.

Table 3. Comparison of selected classroom characteristics for general chemistry, before and after implementing commitments to inclusive teaching.

Classroom Policies	Previous Implementation	Revised Implementation
Assessment	3–4 mid-term exams per semester, 25–35 questions, multiple choice and short answer, limited to the time of the class period, closed-note, individual effort.	10 mid-term exams per semester, 3–15 questions, multiple choice and short answer, flexible time, hand-written reference sheet is permitted, individual effort.
Attendance	Attendance is included in grade calculations and assessed by clicker or by group work participation. Allowances for occasional absences are made by setting some threshold (e.g., 80–90% attendance) to earn full credit for this grade.	Attendance is not graded. Students are encouraged to provide individualized support for absent peers as part of their community learning. Virtual attendance, facilitated by classmates, is permitted.
Group work	Students complete group problem solving exercises for credit during class sessions. Lowest in-class assignment scores are dropped from the grade calculation at the end of term.	Students engage in solving practice problems during class, but they can choose whether to participate with classmates. Participation in small groups during class or study groups external to class sessions can be used to earn credit for community learning.
Note-taking	No broad policy implemented; note-takers recruited as needed per accommodation memos.	Students are encouraged to share their personal notes on the course website as a way to engage in community learning.
Student use of technology	No specific policy.	Students are encouraged to bring devices to class to use online resources and facilitate virtual attendance. Devices are prohibited on assessments, with the exception of headphones, which students may use to reduce environmental distractions.

4. Discussion

Providing accommodations for students who have documented and disclosed disabilities is necessary to achieve equity, but it is not sufficient. One participant pointed out the following.

Deb: I have an appointment in a couple weeks in August that should help me get that ADHD diagnosis and the auditory processing diagnosis, but I know my access to healthcare is like a privilege so a lot of students who can't afford it, they are not getting the accommodations they need to succeed in those classes.

Deb's comment highlights the problem with providing accommodations only for students with documented disabilities. I wondered how many of my students had undiagnosed chronic illnesses, were not able to access healthcare in order to complete the disability support bureaucracy, had other barriers to official accommodations, or did not even know that accommodations were available.

Deb: I didn't meet up with anyone in DSR during my first semester in college. I didn't really know that was something that I could access with anxiety, depression, or bipolar. I thought that was just for physical disabilities that you could see. My disabilities are invisible, relating to my digestive system and mental health.

I knew that the students who struggled to obtain necessary accommodations might have their difficulties compounded by additional factors, such as first-generation status, low socioeconomic status, or membership in other disadvantaged groups.

The idea that classroom materials and methods should be accessible for all students, not just those with a registered disability, is encompassed by the Universal Design for Learning (UDL) movement (CAST, 2018). The goal of the UDL framework is “learner agency that is purposeful & reflective, resourceful & authentic, strategic & action oriented”. Despite the lack of explicit reference to inclusion, the UDL framework offers actionable guidelines for instructors who wish to design their course to be accessible for all learners. The guidelines are categorized according to three principles: engagement, representation, and action and expression. Each principle has themes, and each theme has recommendations. For example, in representation, one of the design options pertains to “Language and Symbols”, with specific recommendations for ensuring multiple forms of representation are available and using respectful language in the classroom. In my own teaching, these recommendations were manifested as curricular changes such as ensuring my materials have appropriate captioning and are accessible by screen readers, and cultural changes such as replacing “you guys” with “you all” in my daily speech.

The UDL guidelines were extremely useful to me while thinking about how to make my teaching more inclusive, but from the interviews with students, I knew that implementation of inclusive policies was not enough. I needed to explicitly address inclusion with my students. The following are Deb and Katie's words.

Deb: I have had some professors who made it clear they would accommodate you if you struggled. They made a note in the syllabus about their willingness to help, even with things like mental health and well-being. They made it clear they were there for their students. They gave details about how to communicate them about our DSR memo. . . When they show that they are ready to take my memo, I can be confident that they will make those accommodations. I've appreciated those professors so much, because it just gave reassurance that I wasn't going to be on my own.

Katie: One professor did a great job taking away that feeling of being a burden. On the first day of class, she mentioned that any student who needs accommodations and has a DSR memo should let her know and she'd work with us to get it set up. . . That announcement let me know she would be willing to work with me, and was happy to work with me. I was glad that professor was so transparent about being willing to help. It made it easier to deliver my DSR memo to her.

The students with disabilities appreciated professors who explicitly stated their desire to be inclusive. Providing a written statement about my values regarding inclusion would not only provide confidence to my students, but it would also give me a way to explain to them (and to my colleagues) why and how I had arrived at the particular instructional choices I have made. Finally, by enumerating my philosophy regarding inclusion, I would be better able to engage in honest self-appraisal and be held accountable by students and colleagues. With these benefits in mind, I engaged in deliberate reflections about inclusion, why I pursue it in my teaching and how I see it implemented in my classrooms. Those reflections and the pedagogical choices I have made because of those reflections became the basis for this manuscript. Another product of the reflections was a set of explicit principles that I have called my “5 Commitments to Inclusion”. I first drafted these commitments

while attending an academic conference to summarize my reflections on a series of keynote speeches about racial equity in education. They were further informed by and refined for application to my teaching, and then broadened so that they could apply to all facets of my daily life. The version below (Figure 2) was written in August of 2022 for inclusion in my syllabus for the fall semester and has appeared in all of my course syllabi since then. Specific people and works that helped to shape individual commitments are cited in the following paragraphs.

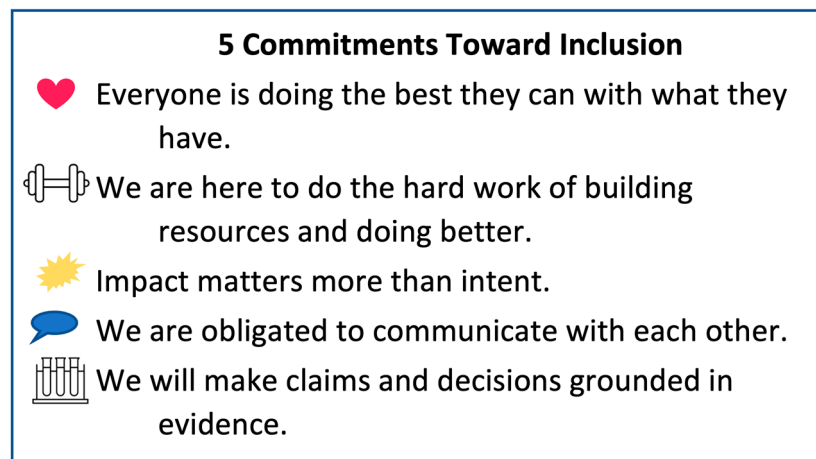


Figure 2. The five commitments as they appear in a course syllabus.

4.1. *Everyone Is Doing the Best They Can with What They Have*

This commitment is borrowed from the Collaborative Proactive Solutions parenting philosophy (Greene, 2017). Although teaching adult students differs from parenting children, it does require a similar level of compassion and empathy, and this mantra has helped me tremendously in both roles. Putting this commitment into practice requires reframing my beliefs about students' participation in my class. My students are not procrastinating or lazy; they are making choices based on their priorities—many of which are unknown to me. My students are not ignoring my helpful study reminders; they have barriers to carrying out the task or I haven't provided enough support yet. When students disparage themselves as "not getting it" or "terrible at chemistry", I remind them, "You're doing the best you can right now". This mantra was picked up by my students: in one class session, I was attempting to write with an old dry erase before rejecting it and muttering, "This marker is terrible". A student quipped, "It's doing the best it can!" to the laughter of their classmates. Greene, the creator of the parenting method, refers to this as a "lens shift". When we embrace the notion that the people around us are doing the best that they can, it primes us to respond with empathy and care.

4.2. *We Are Here to Do the Hard Work of Developing Our Resources and Doing Better*

Recognizing that students are giving me their best does not mean that I cannot set high expectations or ask them for more. My second commitment provides the rationale for our mutual engagement in our course. As the instructor, I am there to do the hard work of providing resources and improving my teaching. Students are there to do the hard work of learning chemistry and developing metacognitive skills. This commitment paves the way for introducing students to a growth mindset, goal setting, and other metacognitive strategies (McGuire, 2015). Orienting our mutual hard work as growth toward our goals, also allows me to empathize with students who are struggling, while reassuring them that the frustration they feel is an indication of the learning process (Bjork et al., 2011).

4.3. *Impact Matters More than Intent*

The saying that “intent is not equal to impact” is often used in a social justice context by activists to call people with privilege to consider their actions from the perspective of marginalized people (DiAngelo, 2018). This credo was applied in education to help instructors understand how their assumptions might be harming their students and to guide instructors on facilitating classroom discourse on sensitive subjects or when instructors need to mediate microaggressive events in their classroom (Meadows & Wickner, 2020). But this statement also affords an opportunity to extend the metacognitive practices and growth mindset of commitment two. Working hard or doing your best is not a guarantee that goals will be met. No matter how excited I am or how much time I spend on reforming my curriculum, if the students are not learning from it, I did not meet my goals. Some students may spend an inordinate amount of time and effort studying, with very little improvement on their understanding of the material. When our impact and intent are not aligned, this gives us a signal that we need to refer to commitment number two and do the hard work of revising our beliefs, changing our actions, and making a new plan to close the gap between intent and impact. What can we use to guide those changes? How will we know if our impact is misaligned with our intent? Only through communication.

4.4. *We Are Obligated to Communicate with Each Other*

To be an effective instructor, I must communicate adequately with my students. Presenting these commitments on my syllabus is my first strategy for communicating my expectations and motivations to my students. On the other hand, students are encouraged to communicate their needs to me and provide feedback informally via email or face-to-face, or formally through structured mid-term teaching evaluations if my efforts are not sufficient. Further, communication goes beyond providing information. It also requires receiving and processing the information. Both students and faculty should listen to each other with empathy and an open mind. This does not however mean that all communication is equally valued in my classroom.

4.5. *We Present Our Claims and Make Decisions Based on Evidence*

This commitment underscores my identity as a scholar. From academic matters such as assigning students’ grades to social justice issues like familiarizing myself with the experiences of marginalized people to everyday decisions like choosing what to plant in my yard, I strive to collect evidence, relying on outside experts wherever necessary, and then arrive at my decisions. It also aligns with the scientific practices that I want my students to adopt in their careers (NGSS Lead States, 2013). And it supports each previous commitment: We know what “doing our best” looks like and can optimize “growth” when we rely on evidence-based practices. We can better understand “impact” when we listen to the evidence presented by those on the receiving end of our “intentions”. When we communicate, we have a responsibility to provide evidence and receive new evidence, and we will engage in deliberation with the data at hand. Practicing scientists know that evidence-based decisions are also supported by theoretical models, i.e., abstract principles that are unobservable, but offer explanatory power (Windschitl et al., 2008). This final commitment, along with the previous four, offers a theoretical framework that allows me to reflect, discuss, and act on issues of inclusion and equity.

5. Conclusions

Throughout this manuscript, I have provided accounts from my research with students with disabilities, described my own reflections on accessibility and inclusion, and given examples of how these ideas were translated into practice in my own courses. You may

believe that my motivation to undertake this work comes from a deep sense of justice and equity, and I do ascribe to those lofty values. However, my purpose also comes from my own experiences needing (and not having available) accommodations. Throughout my life, I have suffered from a sleep disorder. However, it was not diagnosed until adulthood. During my university days, all I knew was this: regardless of how much rest I had gotten previously, I frequently found myself drifting off to sleep. It would happen while watching television, reading a book, or sitting in class. Several times each week, I found myself dozing off during a lecture. One professor chose option “c” from the list above: he ignored my naps and continued lecturing. I know he noticed, though, because he would often make it a point to call on me to answer questions, even when my hand was not raised. I was grateful for his merciful non-response. A different professor chose option “a”, requesting that the student leave. After being un-invited from his class once, I decided it would be best if I only attended on exam days. My commitments tell me this professor was doing the best he could to provide learning opportunities to his students. Yet, I wonder if I had been able to communicate my situation, or if he would have known how his brusque dismissal would impact my engagement with the course, perhaps he would have been able to do better. For instructors who teach large classes, for students who are reluctant to disclose their disability status, this kind of communication may be a barrier. For this reason, instructors should seek out accounts of people with disabilities in order to raise their general awareness of the ways that people with disabilities experience the world. Lists of books written by or about people with disabilities are a good place to start ([Gettysburg College Musselman Library, 2024](#); [Kirker, 2022](#)). It is in this spirit of sharing experiences as evidence, forthright communication, and understanding impact and accountability in the process of reflection and growth, I present these ideas to you, my peers, with the understanding that we are all doing the best that we can.

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References

- Abreu, M., Hillier, A., Frye, A., & Goldstein, J. (2016). Student experiences utilizing disability support services in a university setting. *College Student Journal*, 3(6), 323–328.
- Ben-Simon, A., Beyth-Marom, R., Inbar-Weiss, N., & Cohen, Y. (2008, September 7–12). *Regulating the diagnosis of learning disability and the provision of test accommodations in institutions of higher education*. 34th International Association for Educational Assessment Annual Conference, Cambridge, UK.

- Bjork, E. L., Bjork, R., Roediger, H. L., Mcdermott, K. B., & Mcdaniel, M. A. (2011). Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. In *Psychology and the real world: Essays illustrating fundamental contributions to society* (Vol. 2, pp. 59–68). Worth Publishers.
- Blasey, J., Wang, C., & Blasey, R. (2023). Accommodation use and academic outcomes for college students with disabilities. *Psychological Reports*, 126(4), 1891–1909. [CrossRef] [PubMed]
- Bowen, C. W. (2000). A quantitative literature review of cooperative learning effects on high school and college chemistry achievement. *Journal of Chemical Education*, 77(1), 116. [CrossRef]
- CAST. (2018). *Universal design for learning guidelines*. Available online: <https://udlguidelines.cast.org/> (accessed on 13 January 2025).
- Cole, E. V., & Cawthon, S. W. (2015). Self-disclosure decisions of university students with learning disabilities. *Journal of Postsecondary Education and Disability*, 28(2), 163–179.
- Cooper, K. M., Downing, V. R., & Brownell, S. E. (2018). The influence of active learning practices on student anxiety in large-enrollment college science classrooms. *International Journal of STEM Education*, 5(1), 23. [CrossRef]
- DeKorver, B., Brown, G., & Witcher, S. (2024). Student xperiences of implementation of accommodations. *Journal of Disability Studies in Education* 50, 1–25. [CrossRef]
- DiAngelo, R. (2018). *White fragility: Why it's so hard for white people to talk about racism*. Beacon Press.
- Gettysburg College Musselman Library. (2024, November 4). *Anthologies and collections*. Diversity, Equity, Inclusion, and Belonging Resource Guide: Disabled Voices. Available online: <https://libguides.gettysburg.edu/diversity/disabled-voices> (accessed on 13 January 2025).
- Gibbons, R. E., Laga, E. E., Leon, J., Villafañe, S. M., Stains, M., Murphy, K., & Raker, J. R. (2017). Chasm crossed? clicker use in postsecondary chemistry education. *Journal of Chemical Education*, 94(5), 549–557. [CrossRef]
- Greene, R. (2017). *Raising human beings: Creating a collaborative partnership with your child*. Scribner.
- Grigely, J. (2017). *The neglected demographic: Faculty members with disabilities*. The Chronicle of Higher Education.
- Harrison, J. R., Bunford, N., Evans, S. W., & Owens, J. S. (2013). Educational accommodations for students with behavioral challenges: A systematic review of the literature. *Review of Educational Research*, 83(4), 551–597. [CrossRef]
- Hollins, N., & Foley, A. R. (2013). The experiences of students with learning disabilities in a higher education virtual campus. *Educational Technology Research and Development*, 61(4), 607–624. [CrossRef]
- Kirker, K. (2022, December 7). *Winter reading list 2022: Stories from authors with disabilities*. Rick Hansen Foundation Access & Inclusion. Available online: <https://www.rickhansen.com/news-stories/blog/winter-reading-list-2022-stories-authors-disabilities> (accessed on 13 January 2025).
- Larrivee, B. (2008). Development of a tool to assess teachers' level of reflective practice. *Reflective Practice*, 9(3), 341–360. [CrossRef]
- Lightner, K. L., Kipps-Vaughan, D., Schulte, T., & Trice, A. D. (2012). Reasons university students with a learning disability wait to seek disability services. *Journal of Postsecondary Education and Disability*, 25(2), 145–159.
- Lindstrom, J. H. (2007). Determining appropriate accommodations for postsecondary students with reading and written expression disorders. *Learning Disabilities Research & Practice*, 22(4), 229.
- Lovett, B. J., Nelson, J. M., & Lindstrom, W. (2015). Documenting hidden disabilities in higher education: Analysis of recent guidance from the association on higher education and disability (AHEAD). *Journal of Disability Policy Studies*, 26(1), 44–53. [CrossRef]
- McGuire, S. (2015). *Teach Students How to Learn*. Routledge.
- McNiff, J., & Whitehead, J. (2002). *Action research: Principles and practice, second edition*. RoutledgeFalmer. Available online: <http://www.actionresearch.net> (accessed on 13 January 2025).
- Meadows, E., & Wickner, D. (2020). *Antiracism: Intent vs. impact*. The International Educator.
- Moog, R. S., & Spencer, J. N. (2008). POGIL: An overview. In *Process oriented guided inquiry learning (POGIL)* (Vol. 994, pp. 1–13). ACS Symposium Series; Available online: <https://pubs.acs.org/sharingguidelines> (accessed on 13 January 2025).
- National Center for Education Statistics. (2023). Number and percentage distribution of students enrolled in postsecondary institutions, by level, disability status, and selected student characteristics: Academic year 2019–2020. In *Table311.10*; U.S. Department of Education, Institute of Education Sciences. Available online: https://nces.ed.gov/programs/digest/d22/tables/dt22_311.10.asp (accessed on 13 January 2025).
- NGSS Lead States. (2013). *Next generation science standards*. National Academies Press.
- Nielsen, J. A. (2001). Successful university students with learning disabilities. *Journal of College Student Psychotherapy*, 15(4), 37–48. [CrossRef]
- Oleson, A., & Hora, M. T. (2014). Teaching the way they were taught? Revisiting the sources of teaching knowledge and the role of prior experience in shaping faculty teaching practices. *Higher Education*, 68(1), 29–45. [CrossRef]
- Salzer, M. S., Wick, L. C., & Rogers, J. A. (2008). Familiarity with and use of accommodations and supports among postsecondary students with mental illnesses. *Psychiatric Services*, 59(4), 370–375. [CrossRef]
- Seery, M. K. (2015). Flipped learning in higher education chemistry: Emerging trends and potential directions. In *Chemistry Education Research and Practice* (Vol. 16, pp. 758–768). Royal Society of Chemistry. [CrossRef]

- Shakespeare, T. (2006). The social model of disability. *The Disability Studies Reader*, 2(3), 197–204.
- Stevenson, M. (2010). “If they can’t stand the heat...”: Supporting the academic development of higher education students with anxiety and depression disorders. *The Open Rehabilitation Journal*, 3, 41–46.
- Storrie, K., Ahern, K., & Tuckett, A. (2010). A systematic review: Students with mental health problems-A growing problem. *International Journal of Nursing Practice*, 16(1), 1–6. [[CrossRef](#)] [[PubMed](#)]
- Stowe, R. L., & Cooper, M. M. (2019). Assessment in chemistry education. *Israel Journal of Chemistry*, 59(6), 598–607. [[CrossRef](#)]
- Talbert, R., & Clark, D. (2023). *Grading for growth: A guide to alternative grading practices that promote authentic learning and student engagement in higher education*. Taylor & Francis.
- Valli, L. (1997). Listening to other voices: A description of teacher reflection in the United States. *Peabody Journal of Education*, 72(1), 67–88. [[CrossRef](#)]
- Windschitl, M., Thompson, J., & Braaten, M. (2008). Beyond the scientific method: Model-based inquiry as a new paradigm of preference for school science investigations. *Science Education*, 92(5), 941–967. [[CrossRef](#)]
- Wong, B., & Chiu, Y. L. T. (2021). Exploring the concept of ‘ideal’ university student. *Studies in Higher Education*, 46(3), 497–508. [[CrossRef](#)]

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