A Perfect Storm
How Differences in Privilege and Power Can Lead to Subtle but Potent Inequities in STEM Education

By Anonymous

Often when we consider the causes underlying underrepresentation of women and people of color in STEM, we tend to think about gross causes, such as systemic bias, disparities in academic preparation, and economic inequality. Over the course of my academic career, however, I have observed how small, subtle, and often unintentional behaviors result in differential treatment of particular groups: women, immigrants, individuals from underrepresented minority backgrounds, low-income students, and first-generation college students. In this article, I aim to raise awareness regarding these seemingly small behaviors, which can have significant cumulative effects over time, with the hope that we as educators can better inform ourselves about these behaviors and work to combat them.

For the first 2 decades of my career, I taught at a small, private, liberal arts college. Then, approximately 10 years ago, I relocated to a midsize, public, urban, 4-year college. (The latter institution is part of one of the largest and most diverse university systems in the United States, a system that enrolls more than 250,000 students annually.) When I shifted between these two environments, I became aware of the subtle behaviors we engage in that can disproportionately affect certain groups.

Student demographics
The differences between the environment, culture, and norms of my first and second institutions were striking. At my first institution, the student population was fairly homogeneous. Students were overwhelmingly White and middle to upper class and had parents with professional degrees. Students attended school full time, and only a handful worked part time. The college was residential.

My second job could not have been more different. A large percentage of students were Black or Latinx. A significant number were immigrants or children of immigrants (about two out of five students spoke English as a second or third language), with large numbers hailing from the Caribbean, Pakistan, and the former Soviet states. Nearly one-third of students were first-generation college students. Students often came from low-income households, with a large number of students reporting annual family incomes of less than $25,000. (About half were Pell Grant recipients.) Most students’ parents worked at blue-collar jobs. Nearly half of the students worked, and most worked at physically demanding jobs (e.g., a server at a fast food chain, a childcare worker, or a home health aide). The vast majority of students commuted.

Students’ varying levels of academic preparation posed a challenge for teaching. Whereas at my first job...
The institutions

Not surprisingly, one of the biggest differences between the two institutions was the staff-to-student ratio. For example, at the private institution, the academic advising center had a caseload of about 50 students per adviser, while there were approximately 1,500 students per adviser at the public institution. At the private college, one section of Organic Chemistry I was offered each year with an enrollment of 50 students per adviser, while at the public college, two or three sections of Organic Chemistry I were offered each year, and each section enrolled up to 200 students.

Opportunities for faculty to get to know students were, of course, more limited at the public institution because of the larger lecture classes. However, it was also the case at the public institution that smaller laboratory and recitation courses were mostly taught by contingent faculty and graduate students, whereas at the private institution these courses were often taught by full-time faculty. As a result, full-time faculty at the public institution had less direct contact with students.

The faculty

At the private institution, faculty were under pressure to publish and obtain grants, but they did not work with graduate students or have a doctoral program. At the public institution, faculty members were affiliated with our university’s doctoral program, and STEM faculty were under much more pressure to publish and obtain competitive grants. However, the institution did not have strong financial means to support faculty research. The combined pressure to produce along with the lack of resources created a lot of stress for faculty at the public institution, especially pre-tenured faculty.

Faculty at the public institution were well intentioned and committed to combating inequities in STEM. However, through no fault of their own, many lacked experience in teaching such a diverse population. Faculty were qualified and well trained, but their expertise was in scientific research, not in teaching. They did not know how to modify their teaching strategies when faced with struggling students, and they were unaccustomed to working with our student demographic. Many had attended graduate and postdoctoral programs at predominantly White institutions. Some had grown up abroad, had not done their undergraduate studies in the United States, and lacked familiarity with the U.S. educational system. In contrast, at the private institution, many of the faculty were similar in ethnicity and social class to the students. They readily related to the students and easily adapted their teaching to students who had strong and homogenous backgrounds in science and math.

Student personae

Some of the institutional challenges at the public institution are common at other large institutions (e.g., large class sizes, classes taught by graduate students, pressure on faculty to publish and obtain grants). However, I observed instances of bias and discrimination related to the attributes of the students at the public institution.

At the private institution, students’ behaviors could give the impression they felt they were in charge. Some behaved quite antagonistically if their desires were not fulfilled. If they were unhappy with a grade, they would often argue in an aggressive manner. If an instructor did not give in to their desires (e.g., regarding a grade dispute, a desired make-up exam, or a late withdrawal), some students would take their complaints directly to the college dean. As a result, faculty often were put in the position of having to defend routine aspects of their jobs (e.g., exam format, choice of a textbook, etc.).

In contrast, at the public institution, the vast majority of students did not advocate for themselves. These students were hard working and motivated and gave the impression that they cared very much about their performance; most were also highly deferential toward faculty. Students were calm and accepting of academic decisions made by faculty and administrators. Most students were unlikely to question grading errors or to speak up even in clear cases of mistreatment. But students also often behaved as if they did not feel like they had permission to take advantage of the most basic resources at the college. For example, I sometimes had students email me to ask permission to attend my office hours, and I once even had a student ask permission to sit when attending office hours. At the public institution, I observed that faculty generally were in charge and that most students accepted whatever treatment they received (good or bad). If students resisted actions against
them, their resistance took a subtler form, such as working harder and strengthening their resolve to overcome obstacles in their path.

At the public institution, I spent many hours getting to know the students and their backgrounds, family situations, and histories. Over time, I learned that it was the students who were immigrants, children of immigrants, from low-income households, and the first in their family to attend college who were less likely to advocate for themselves. I gradually realized that many students had jobs in which they had to serve or work for others who were of a higher socioeconomic status and that keeping their jobs required that they adopt, and perhaps internalize, a subservient attitude. I also learned from the literature and my own research that a lack of assertiveness may have been due to students’ lack of familiarity with higher education in the United States (on the part of immigrants and first-generation college students; see Collier & Morgan, 2008; Nichols & Islas, 2016; Stephens et al., 2014; Wilbur & Roscigno, 2016) or less well-developed academic self-regulation (on the part of first-generation college students; see Davis, 2010; Horowitz, 2019; Jehangir, 2010). In particular, I became aware that many of my students may have been less likely to seek academic help (to their significant detriment) because they were first-generation college students (Horowitz et al., 2013; Nichols & Islas, 2016; Schwartz et al., 2016; Stephens et al., 2014; Winograd & Rust, 2014). I observed, however, that a minority of students at the public institution—middle-class students, White students, and some male students—felt much more entitled to advocate for themselves, whether simply to ask questions about course format, seek academic help, or complain about perceived unfair treatment.

A climate ripe for inequity

At the public institution, I observed that small, seemingly innocuous actions led to discrimination against the least-empowered students. This discrimination took two forms: unequal treatment in course-related decisions and inappropriate conduct from some instructors.

The squeaky wheels and the silenced wheels

Students (typically first-generation college students, women, and students of color) would often report to me instances in which they felt they had been treated unfairly by STEM instructors. For example, one female student reported to me that she had received a grade of F in a course in which a male friend of hers who had a slighter lower course average received a grade of C minus. (I was the recitation instructor for this course, and upon checking course records, I determined that this student’s statement was indeed true.)

Another female student in a recitation section of mine was given F in the lecture portion of the course because some of the answers on her final exam looked similar to those of another student, though there was no evidence that my student was the copier or was aware of her work having been copied. Despite my encouragement and explanations to students about school procedures and rules, these students and others in similar situations rarely pursued their grievances, even when actions taken by instructors were seemingly in conflict with school rules and policies.

Given what I knew about the lack of assertiveness of the students at the public institution, I was not surprised when students did not advocate for themselves, even in situations that seemed like clear-cut violations of school policy. However, I was not surprised by students’ inaction because of what I knew about some faculty’s lack of responsiveness to student petitions. Given the large student-to-staff ratio at this public institution, it was not surprising to me that some instructors did not respond to student emails. But students who might have initially been inclined to seek help with coursework or pursue instances of unjust treatment gradually learned that their attempts to reach decision-makers were often futile. The lack of responsiveness from faculty, along with students’ lack of confidence, led to a situation in which female students and students from low-income and minority backgrounds felt powerless to advocate for themselves in the face of educated, often male, mostly White, middle- to upper-class faculty.

In contrast, however, I observed that confident, assertive, persistent students who felt entitled were more likely to get their concerns heard and their needs addressed at this public institution. I experienced firsthand a situation in which the aggressiveness of one White male student earned him a privileged arrangement, while the lack of aggressiveness of a Black female student in a similar situation prevented her from obtaining a similar advantage. Both students took the same course with me. Each took an exam and then within about 24 hours emailed me to report that they had not done well on the exam because of a family incident that had taken place in their home the night before the exam. Given that both students did not report their situations to me until after they took their exams, I told
them that their exam grades would stand and could not be undone. The Black female student accepted her fate, but the White male student did not; he eventually pressed an administrator into allowing him to retake the exam.

Unfortunately, this student’s case was not unique. I observed that several White male students who appealed their cases to STEM administrators had their cases investigated and adjudicated. (As a faculty member, I participated in several of these investigations.) Yet first-generation college students, students of color, and women who made only one or two gentle overtures typically had their situations completely ignored.

**Abuse of power**

Unfortunately, at this public institution, where most students felt powerless to complain when they felt they had been treated unjustly, I also heard numerous stories from students about inappropriate comments and behaviors from STEM faculty. Knowing that at my first job no faculty member could have ever gotten away with speaking to students the way some faculty did at the public institution, I tried to encourage students to report some of the most inappropriate behaviors they described. But even before I could offer words of encouragement to the students, it was clear to me from the students’ demeanors that they were afraid to speak up and that everything they had learned up until that point about their role and lack of privilege in society—as immigrants, as women, as students from low-income households, and as people of color—had taught them that rocking the boat would do no good and might actually make things worse.

**How can we address these issues?**

I have thought a great deal about what led to the inequities and abuses of power at the public institution. Ultimately, I decided to share these stories so we can all become more conscious of our behaviors and of the squeaky and silent wheels among us. Additionally, given that students of color, students from low-income households, and first-generation college students are more likely to attend public institutions (McFarland et al., 2019), I concluded that it was also important that those who teach at private and public institutions have the opportunity to compare and better understand the different landscapes at these two types of institutions.

But how can we overcome the challenges of public institutions like the one I was at? At institutions where the student-to-faculty ratio is large, it is easy to feel overwhelmed by large numbers of students (e.g., during office hours) and to get sucked into stimulating conversations with strong students. It takes conscious effort to look out for the quieter and sometimes less-prepared students. It is easy to get frustrated with unprepared students or students who perhaps do not show up at all, especially if one is unaware of how socioeconomics and first-generation status can affect how students behave in university settings (Collier & Morgan, 2008; Stephens et al., 2013; Stephens et al., 2019).

Knowing the background of one’s students and how it impacts their academic behaviors is an important step in tackling the bias that underserved students encounter (Horowitz, 2019). Institutions with diverse student populations need to educate faculty regarding their student populations, but faculty need detailed, descriptive information about their students’ lives (not just statistical or demographic information). Faculty need training in how to teach these populations effectively—training in student-centered pedagogies that have been shown to be effective in improving performance for underserved groups (Freeman et al., 2014; Lewis, 2011; Lorenzo et al., 2006; Moog et al., 2006) and training in the challenges faced by students who are unfamiliar with higher education in the United States (Horowitz, 2019).

Departments need to have strict policies for how student complaints are filtered and handled so that all complaints are screened fairly. Department and institutional policies regarding complaints and other procedural matters need to be transparent and publicly disseminated. For cases in which students are afraid to report issues of concern, they should be allowed to submit complaints anonymously or go directly to a neutral party for adjudication, rather than (as is sometimes done) meet with their instructor first.

I do not have all the answers; I only have the beginning of a few suggestions. I hope the ideas in this article can add to the conversation regarding issues of equity in STEM.

**References**


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