Mentoring for diversity in technology

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Psychosocial mentoring for both students and managers can help people from different backgrounds develop into a team and a community.

For science, technology, engineering, and mathematics (STEM) students, there are two major types of mentors: research or scientific mentors and, if they can find one, psychosocial mentors. Psychosocial mentors help students, and even professionals, learn how to reframe experiences, deal with people, and be resilient in their lives. My mentoring ideas have come from my own experiences with mentors, some good and some not so good; from what I learned backpacking for almost five years after getting my English degree and before finding my path to graduate school and becoming a scientist; from having a profound love for science and creativity; and from my belief that Albert or Alberta Einstein might be a student living anywhere, including in New Mexico. I have not studied mentoring as much as I have mentored. My passion has always been to work with students over the long term.

My mentoring approach is not about convincing anyone of their path or how to be inclusive, but about allowing students to find the magic inside themselves and helping senior managers to see diversity and understand their role in achieving it in a new way. My mentoring program for students is based on a set of universal principles that allow people from different backgrounds to develop into a team and a community. It is designed to teach them how to reframe experience, and to develop insight, creativity, and a sense of connection to their lives. Psychosocial mentors complement what research mentors do. Students learn science in the laboratory, and ethics and resilience from psychosocial mentors. For the purposes of this article, diversity covers gender, race, and ethnicity, as well as different skills and backgrounds. By inclusion, I mean bringing

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individuals from diverse groups together to successfully build and sustain diverse teams.

In mentoring for diversity in technology, it is important to keep in mind that there is an ecology to every business environment and an ecology to hiring. A mentor would love to be able to touch each node in the network—from the hiring officials to the manager, co-workers, and other team members—to make the team work well, but most often, we are able to work only with students as they wind their way toward a career. In this article, I will discuss: (i) diversity, and how far we are from achieving it; (ii) principles to guide reframing, or looking at an event or a situation from a different perspective to learn the most from it, creativity, and resilience; (iii) how in-group dynamics can be barriers to diversity; and (iv) achieving diversity by connecting hubs.

Since civil rights legislation was passed in the 1960s, Americans have attempted to make less common the non-random composition of groups of people based on race and ethnicity, equating an increase in diversity within groups with an increase in equality of opportunity. But somewhere, between the classrooms, homes, workplaces, rooms where confidential hiring decisions are made, and young people themselves, we have not achieved this dream. Because the problem has proven so difficult, achieving diversity and inclusion are seen as wicked problems, in that they persist for long periods of time and have social, political, and/or cultural aspects that make them appear not to have solutions[1].

Technology needs diversity

Achieving a level of diversity in companies makes good business sense on many levels. Diverse teams have been shown to be more successful[2]. Having a variety of perspectives allows a group to solve hard problems[3,4]. Finally, a workforce that represents our nation's diversity speaks more easily to all stakeholders.

Given these positives, the fact that we haven't achieved diversity, says: (i) achieving diversity is a wicked problem; (ii) we don't yet know the answers or we would have fixed it by now; and (iii) we need to look more creatively and deeply at what the barriers might be.

Know our assumptions. As mentors, knowing our assumptions is key to success. For example, if we ascribe all the problems students have to the impact of poor high schools, we limit their futures. Poor high schools make college tougher at first, but a smart, motivated person can learn. Many of us work in subject areas distinct from our college majors, so we know, once fear of failure is overcome, it is possible to learn entirely new disciplines. When faced with a new situation, some people tend to be quiet, and a quiet person is often wrongly assumed to be less intelligent. This barrier can be overcome if the quiet person knows it is a barrier and the interviewer becomes aware of their own assumptions. There are many more assumptions that each of us must uncover to be successful mentors and achieve our goal of working with mentees to become resilient and have valuable careers and lives.

Diversity won't happen unless everyone 'wants' it. I recently asked a group of biotech leaders about diversity training at their companies. While everyone had had this training, essentially no one could remember it as being fun. Honestly, the only way to achieve change is to make it compelling, for example, by saying, "Be on my team; we are going to discover amazing things." Diversity isn't always easy but it can be fun, and the sooner we agree to making it our goal, develop trust, and communicate honestly and openly, the sooner we will achieve it. Getting feelings about diversity out in the open and talking with people who have addressed them is the best way to begin to reframe the discussion and see what
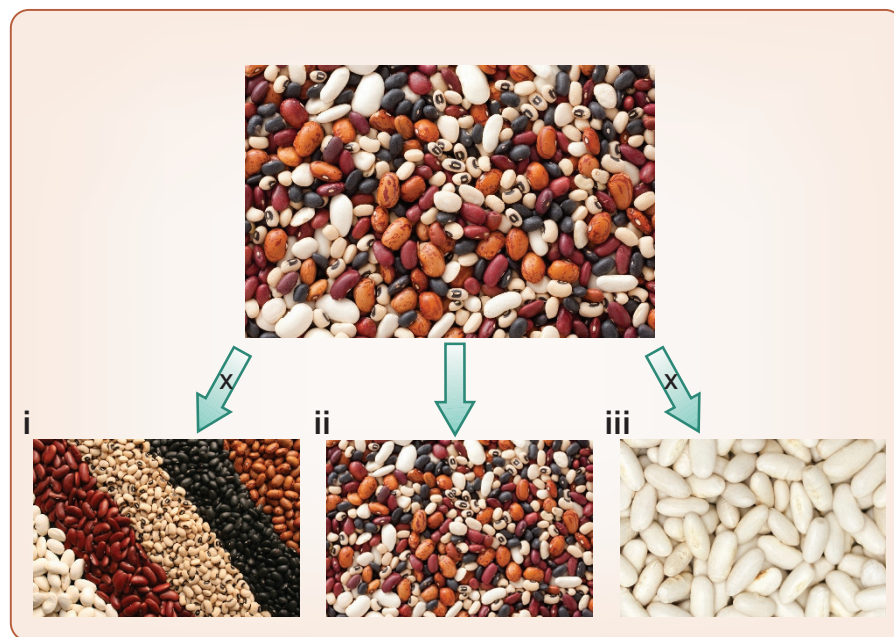
Figure 1 Three possible outcomes from starting with a mixture of beans: (i) beans sorted by type; (ii) mixed beans; and (iii) a group of white beans. "i" and "iii" are energetically (entropically) unfavorable and require energy input to maintain. "i" is the grouping we see in our cities, in middle and high schools, and in our social life. "iii" represents the top levels of government, academia, and business.

are the even deeper barriers to diversity and inclusion.

'Fixing' mentees or 'adapting' to the environment. Many mentoring approaches are criticized for trying to 'fix' a student or starting with a deficit model that sees poverty, disabilities, and other characteristics as negatives. In contrast, my goals in mentoring are to help a student (i) know their strengths; (ii) learn to take a moment to read a situation; and (iii) quickly reframe it to make it work. In working with students, I am reminded of my own experience moving from South America to interior Alaska in early 20s. It was a huge shock to be cold. I had to learn about clothing, heating with wood, hypothermia, eating food we hunted, and the incredible experience of life at –60 °F. Success was about adapting. It was also about finding out what I was capable of doing, knowing the risks and challenges, and learning from them. It was exciting and risky and helped me tremendously to survive and thrive as a faculty member and scientist. Thus, what I do in mentoring is not about fixing deficiencies but about letting students and others discover or rediscover their own abilities: leadership, creativity, critical thinking, resilience, and emotional intelligence.

Principles as a guide to resilience. In mentoring, my goal is to produce honest, empathetic, creative students who know what their passion is and how to follow it. A part of this is a focus on several principles and the concept of working as a team. In this process, the students practice reframing, empathy, and creativity, and most come to see that they can grow the source of real innovation and creativity that is inside themselves.

Principle 1: know your heart. Amazingly few young people have thought about what they really love to think about. They may have chosen a college major because a family member suggested it. Knowing your heart is being clear about what your values are, what you love to think about, and where you will put your foot next—not where you will be in five years. It is a life-long practice of being aware that we want to do what we are doing. Once a person knows their heart, they are self-motivated, tend to become happier, and longer-term mentoring can start.

Principle 2: look for the positive or the blessing in everything. This principle teaches leadership. It should force us to stop and get a complete view of a situation. It doesn't mean 'ignore' or 'negate' your feelings. But when you have an experience that seems negative or is painful, identify not just the negative but also the positive. This principle encourages us to see the complexity of things, so that we can choose a positive path forward. Principle 2 helps with many different situations, from a bad boss or a stock loss to overt racism and microaggressions. As an example, when someone is unkind to you, you have immediate positives: you aren't them, and you aren't married to them! That seems funny on the face of it and gives us a moment to realize that we choose how to respond, that we do not have to get in the dirt with the person. Principle 2 helps us to not accept the role of victim and see that any failure, when seen as a teacher, is not a failure. It helps us lead in a positive direction more quickly.

Principle 3: embrace who you are and bring it to the table. We all have two major, personal narratives. First, we are the end of a successful lineage of human beings who sacrificed and loved and won and lost so that we could be here—our family stories. The second personal narrative is from our birth to the present. That is an important narrative to have available—like an elevator speech—that frames our personal characteristics. Because every human being has each of these narratives, it provides a shared space to begin to talk together before we focus on our individual characteristics or differences. This is the diversity principle.

Forming diverse and inclusive teams

The three characteristics of a great team, in addition to having a common goal, are: (i) good, honest communication; (ii) willingness to watch each other's backs; and (iii) no unnecessary emergencies. If a group agrees to these characteristics, it takes a great deal of drama out of discussions about how to make a team work. Not everyone can mentor this way, and I do not believe it is possible for research mentors to work this way with their students. But if you can—or if someone on your team or in your corporation can—it can lead to long-term success. The principles, which anyone can devise, work when they are universals that form a structure for deeper discussions during challenging times.

In-group dynamics can be barriers to diversity and inclusion. As much as we can work individually, inclusion requires the group to function.

All things being equal, the difficulty we have in forming diverse and inclusive teams is frequently based on the ease with which we all form in-groups with 'like' people[5,6]. This social dynamic is undoubtedly an evolutionary characteristic, but if we believe that diverse teams are better, we have to be conscious of who is in our in-group. We hire for comfort and prestige[7]. We choose teams based on ease of communication. We often ignore or discount people with vastly different backgrounds. Knowing our tendency to form in- and out-groups presents a huge

opportunity to create change. If we know the barriers to forming successful, diverse teams, we can discover ways to overcome them.

When I talk to business people and scientists in charge of hiring, I often start by talking about beans (**Fig. 1**). We aren't emotional about beans and they can teach us about human communities. If we start with a mixture of beans, we have at least three possible outcomes: (i) beans sorted by types; (ii) mixed beans; and (iii) a group of white beans. As scientists, we know that "i" and "iii" are energetically (entropically) unfavorable and require energy input to maintain. But "i" is the grouping we see in our cities, in middle and high schools, and in our social life. The white beans in "iii" represent the top levels of government, academia, and business.

There are reasons why these groupings persist, but I hypothesize that they persist for understandable reasons: humans want to be with people who are like them. It's easier and no one asks you why you eat this or that, etc. This is also sustained by the cost of housing in different places and other reasons. The white bean group is sustained, I hypothesize, by proximity, shared cultural values, and socioeconomic status.

In-group members may be unaware of their group, but the edges are clearly seen if you are in an out-group. Information is passed almost invisibly within the in-group but out-group individuals ask themselves, "What are the rules? Who has the power? How do you get and keep power?" Once an in-group is formed, prestige bias leads to equating in-group characteristics as 'good' and out-group characteristics as 'bad' or 'less than', even by members of the out-group. In-group members may not be aware of the prestige afforded them.

In-group/out-group dynamics operate all the time in research, teaching, hiring, and other workplace environments. This tendency to associate in like-groups, where we are comfortable, has probably been with humans from very early days, but if we truly believe that, at work, diverse groups are better, we need to spend more time working together to understand what can motivate us, without guilt or anger, to want to move and enjoy moving between outcomes "i" and "ii" (**Fig. 1**).

If we want to go easily from "i" to "ii", then we need to find ways to have in-groups be more family-like, and be much broader and more inclusive. Finding examples where this has worked is important. The movie *42*, about Jackie Robinson breaking the color barrier in Major League Baseball, provides an important example of someone at a high level—Brooklyn Dodgers' general manager Branch Rickey—reaching out to a person in an out-group and the process of opening up the team's players and staff to include Jackie. Both Rickey and Robinson were emotionally intelligent and committed, and wanted it to work. Robinson was a hero, but my favorite line in the movie occurs when Jackie asks Branch why he brought him into the team and Branch replies, "You made me love baseball again." Successfully diversifying in-groups needs to include benefits in both directions.

Achieving diversity by connecting hubs

Our universities are not yet educating enough underrepresented minorities and women in some fields to create diversity by mass action, or increases in the overall representation of underrepresented students. Thus, I propose to increase diversity at a greater rate by connecting people who are 'hubs', who know many people at different levels of careers. In my life, Mary Clutter, former assistant director for the biological sciences at the National Science Foundation, and Clifton Poodry, senior science education fellow at the Howard Hughes Medical Institute, have been hubs. They provided advice and connections, and alerted other people to me during my career. While hub interactions are what maintain old boys' networks in the white bean sector, in fact, with hubs that embody inclusion, it is a mechanism to open up in-group status to more people.

If I were in biotech and looking for talent, I would have a list of hub people to contact, including faculty and staff at undergraduate and graduate schools and in government and business. We have not activated a hub network across cultures in this country, and it shows. We need more extensive conversations among hub people of all sorts—from universities to community colleges to biotech companies. I would invite hub people to give presentations, because every business needs some of these people at every level. It is how Branch Rickey found Jackie Robinson, and it may be how you find your best talent. This is an exciting and challenging time and all of us need to make it fun.

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