INVITED GUEST EDITORIAL

Why All the Clamor Over Diversity and Inclusion?

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The short answer: It is the critical factor for the United States to increase our output and quality of engineering graduates. Companies are interested in hiring diverse students—and those trained to work on diverse teams—because diverse and inclusive companies are more likely to have financial returns above their national industry medians.

A longer answer is contained within the perspectives piece by S. Farrell and A. Minerick. This article provides background for chemical engineering educators to understand in greater depth how diversity and inclusion impact our recruiting, our students, our retention, and the versatility, adaptability, and quality of graduates from our programs.

Diversity is usually framed by counts of people fitting into a finite number of labeled buckets. Inclusion refers to active and intentional engagement with people of multiple dimensions, multiple backgrounds, and multiple assets to build an environment in which everyone has opportunities to reach their full potential and in which everyone's contributions are valued. Exclusionary cultures cull highly qualified, creative, and innovative minds. Students who encounter exclusions turn away from engineering due to these factors (because "it wasn't a good fit") much more often than for reasons of ability or interest.

We are each a product of our training and experiences, which we rely upon for current and future actions and priorities. However, our training and experiences are biased—they are most informed by the typical (usually majority) individuals we have directly observed. If we have not directly observed individuals from a different gender, race, etc. in context (*e.g.*, our classrooms or as professional engineers), we draw upon secondary experiences from media or elsewhere that are not in context. From these, everyone holds unconscious beliefs about social and identity groups. Conscious thought is estimated to account for ~ 10% of brain capacity; thus, subconscious and unconscious beliefs dominate such that automatic responses precede deliberate, reasoned reflection. The end result is that typical individuals are granted de facto credibility and inclusion in discussions, etc., while "others" are not.

Our brains also try to rely on probability to predict future events, but our accuracy is poor because we remember negative things more vividly than positive. In a 50-person class with two African-Americans, four Hispanics, six Asians, and 38 white students, we pay much more attention to any indications of faltering by African Americans, Hispanics, and Asians than faltering by the whites. Combined with student-to-student biases that cause isolation and lower inclusion of non-majority students in study groups, as well as student awareness of stereotypes where they stand out as "different," our students aren't being treated equitably nor being positioned to showcase their best work and abilities. As educators, we often allocate our time and resources to those we perceive to have a higher probability of success; our perceptions are guided by past experiences, which are faulty and biased. If we function as educational gatekeepers instead of educational coaches, we fail to support students as they grow and adapt their problem-solving skills. We reduce assessments of our students down to purely linear right/wrong grades that fail to cultivate the creativity, adaptability, and nonlinear designs so desperately needed in our graduating engineers.

In summary, we should be embracing additional qualities in our incoming, widely diverse students. The engineering skills (*e.g.*, solving complex engineering problems, design in situational context, teamwork, communication) that companies are begging us to impart on our students don't correlate to the narrow criteria often used to assign grades in rigidly constrained engineering problems. What coaching can we do to enable students with assets from all different molds to excel in engineering? Further, how can we leverage these diverse students and their assets to enhance the education of "traditional-mold students" to help them adapt and together cooperatively solve ever-changing global engineering challenges? These diversity and inclusion articles provide a starting point—to asset-based educational models that enhance engineering creativity, engineering diversity, and engineering rigor. ❐