

Do Short-Term Diversity Trainings Have Lasting Effects?

Dr. Laura J. Bottomley, North Carolina State University, Raleigh

Laura Bottomley is the Director of Engineering Education for the College of Engineering at NC State University. She has worked in engineering education from preK-20 for more than 30 years, starting the Engineering Place for K-12 Outreach at NC State in 1999 and the Women in Engineering Program in 1998. She has been recognized with the PAESMEM award, once as an individual and once as a part of a program award, but her students would say that her Superbowl commercial was the greater recognition!

Kimberly Pender

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The desire to institute diversity training for large organizational populations is common, but the opportunities may be limited, particularly in the case of university students, faculty, and staff in a large College of Engineering. In this time in history, when incidents related to bias against diverse populations, whether that diversity is racial, ethnicity, gender, sexuality, or ability-based, the desire to inculcate attitudinal and skill-based sensitivity to diversity is particularly important.

NC State University has established diversity training for faculty, staff, and students. The training is online and provided by a well-recognized organization, EverFi. Training for undergraduate students is optional. For faculty and staff, the University has set in place a required DEI Training Component for performance plans, which can include EverFi training, among other activities.

The NC State College of Engineering desired to provide additional attention to the importance of diversity for engineers. Desiring to maximize effectiveness, in-person training was selected, despite the difficulty of enforcing a required in-person training for thousands of students. As a first step, a diversity, equity, and inclusion module was designed for use during new student orientation. This module consisted of a 45-minute session led by engineering DEI professionals. It was implemented through a short discussion followed by facilitated role plays. The module was implemented and tested on a smaller scale for testing before its use with the large incoming student population.

This paper presents assessment results from three implementations of the module, done after six months. The first was as training for engineering students hired as leaders for engineering summer programs. The second was for a group of college advisors working with high school students. The final implementation was as a part of new student orientation for 1800 new first year students.

Diversity Training Design

The design of this training is based on an input/output model derived from Bezrukova, et al. [1] and is shown in figure 1. Bezrukova, et al. analyze diversity training from a multidisciplinary perspective based on combining organizational change theory and educational training models, particularly motivation and learning theories. One of their results is that the context in which the training is offered is an important input to the motivation of participants to engage. An important addition is that training works better when infused with perspective-broadening content.

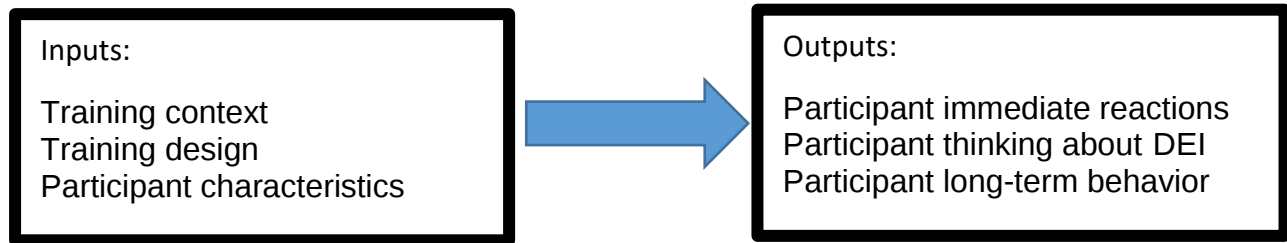


Figure 1: Input/Output model for DEI training module

We will consider each of the types of input separately. For the three instances in which we implemented our training, the context differed. The three groups are described in table 1.

Table 1: Description of the three attendee groups

Group name	Attendee group	Demographics	Context	Mandatory?
New Student Orientation (NSO)	Incoming first year engineering students	Mixed race and gender group, approx. 16% URM and 30% female	Part of first year orientation in summer, integrated with College portion	Non-mandatory but one of only two mandatory choices N=600, (repeated 8 times with 75 each)
College Advising Core (CAC)	High school teachers/counselors in a university setting	Mixed race and gender group, mostly female	Part of training on engineering	Mandatory N=14
The Engineering Place (TEP) summer programs	K-12 teachers and undergraduate engineering students	Mixed race and gender, approx. 50% female	Part of training before leading engineering summer camps	Mandatory N=32

The trainings were designed similarly, with one difference due to the number of participants in the student group. The participants in both the CAC and TEP groups likely had higher motivation toward the training than that of the NSO group, even though those trainings were mandatory. The students in the NSO group had a choice between extra academic advising and attending this session, so it was likely viewed by the attendees as mandatory. In addition, we expected the incoming engineering students to generally have mixed attitudes toward DEI, while the other two groups would have more positive attitudes and even, possibly, more experience.

The design of the trainings was guided by two meta-analyses of diversity trainings, Kalinoski, et al. [2] and Bezrukova, et al [1]. We began by enumerating desired learning outcomes. We knew that short, single instance sessions were less likely to have a strong impact, but we found evidence that they could still have a measurable effect on cognitive, affective, and skill-based outcomes. (Kraiger et al. [3] defines affective-based outcomes as attitudes and motivation, skill-

based outcomes as related to behavior change, and cognitive-based outcomes as knowledge and cognition strategies.)

We desired effects in each of the three areas, but kept those expectations realistic. We did not have time to impart a lot of information, so we designed the training to focus on a few characteristics of DEI that corresponded to good engineering (which we will explain further later). We focused on imparting a little bit of knowledge combined with some specific skills. We also attempted to appeal to affective learning, knowing that serious attitude change requires long-term engagement, but some participants might be already on a DEI journey and this training might help modulate implicit bias through cognition.

For students, this session might have been their first encounter with DEI. They would continue to encounter embedded references to DEI throughout their two-semester first year engineering courses. It was therefore important that the training have some of the design principles that Kalinoski, et al. [2] and Bezrukova, et al. [1] found to be among the most effective in producing positive outcomes. Below is a list of the principles included.

1-Present information from an information-processing/decision-making perspective and NOT from a social categorization perspective [2]. Language that evokes social categorizations has been shown to be associated with negative effects like the formation of in-group and out-group attitudes.

2-Place the information in relevant context [1]. If the context provides more motivation to learn, training effects will be stronger.

3-Design the training to include cooperative, active, face-to-face learning [1,2].

Using these principles, and taking into account the specific audiences, we designed each training to meet our learning objectives for the specific audience and in the time allowed.

The Engineering Place Summer Programs (TEP)

The Engineering Place Summer Programs staff consisted of twenty-nine (32) K-12 teachers, College of Engineering staff, and current engineering undergraduate students. Approximately 1/3 of the participants were teachers. The time allotted for the session was one hour.

The session began with a short presentation that included information about definitions of diversity, equity, and inclusion, information about the diversity of the College of Engineering at NC State University, and ideas about why diversity is important for engineering. These were intended to set the stage and motivate the attendees for the session, as well as give them information about the College that they could use in interactions with students and parents during the summer programs.

After the presentation, the participants were divided into groups for a role-play activity. Each group was given a different scenario and given time to discuss it amongst themselves. They were instructed to choose actors and be prepared to present the scenario with possible solutions to the rest of the group. The scenarios used were:

Scenario 1:

You are watching groups work on a project. You notice that in one group, there is one student that is not participating. She is standing on the edge of the space watching the three boys in her group build their design. What do you do?

If you choose to talk to her, she tells you that her group is not listening to her ideas. She has several designs in her notebook.

Scenario 2:

You hear several kids laughing at a table at lunch. One of them is teasing another one about their accent, imitating them and laughing. The others also laugh. The one being teased has tears in his eyes.

What do you do?

Scenario 3:

The teacher in your room says, ok boys and girls, let's get busy with our projects. She asks them to remind the class about the requirements, and when one student whose pronouns are they/them answers the question, the teacher says, "Yes, young man! Excellent!"

What do you do?

Scenario 4:

You observe a student playing around with the materials, despite the teacher asking everyone to listen to instructions. When you look at her notebook, she has nothing written.

What do you do?

Scenario 5:

One of the boys in your class is named D'Andre. The teacher calls everyone by name, but when she talks to D'Andre, she hesitates and then calls him Andre. Sometimes she just points at him instead of using his name.

What do you do?

After the groups presented their solutions, the facilitators led a group discussion about the solutions chosen and other possible reactions. The emphasis of each scenario was to have the participants think of themselves experiencing such an instance as a part of their teaching and to give them practical responses. The presentation concluded with showing an image¹ of equality, equity, and inclusion. We pitched the inclusion image as also representative of an important engineering design principle, that of Universal Design [4].

¹ <https://repository.library.noaa.gov/view/noaa/38592>

The participants reacted very positively after the session, staying for some time to continue discussion. One student participant disclosed that they had experienced the very scenario about naming that had been used in the training, and that they really felt “seen” by its inclusion.

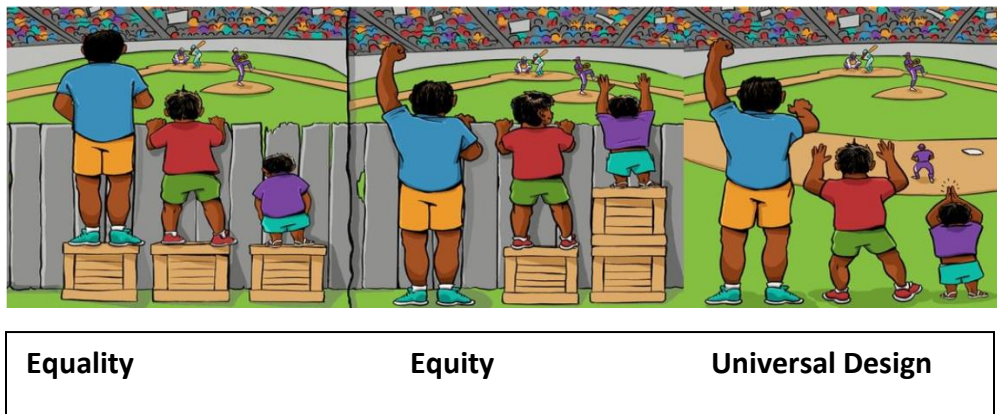


Figure 2: Comparison of Equality, Equity, and Universal Design (Inclusion)

College Advising Corp (CAC)

The College Advising Corp training involved fewer attendees and was designated for one hour duration. The purpose of the Corp is to prepare teachers to advise students in regions of the state that historically have fewer college-goers. This DEI session was embedded in a day-long training on engineering, so we addressed things like which groups are typically underrepresented, what students need to be prepared to study engineering in college, why math should not be the gatekeeper, and other related topics.

We used the same role-play scenarios with this group that had been used with the TEP group, followed by showing a short video play. The Women and Minority Engineering Program staff at NC State had made the video to demonstrate the effects of advising interactions on students during the summer of 2020 as a part of a longer training on diversity with university faculty and staff. The video is called, “WMEP Role Playing Faculty Student Interactions².” It includes a scenario where a student, who is an African American female, goes to see an advisor to ask for help with difficulties in her classes. The advisor reacts by suggesting that she consider leaving engineering. The same student then goes to see another advisor who helps her process her difficulties and reassures her about engineering, then helps her make a plan going forward. We shared with the participants that the scenarios are based on actual students at our university, so that it would be clear that they are not manufactured in any way. The workshop concluded with the same visual of equality, equity, and inclusion in figure 2.

² <https://youtu.be/TDtyxcatlZg>

The feedback immediately after the workshop, the responses were overwhelmingly positive. All of the participants rated the workshop as extremely useful or useful for a person in their position, with $\frac{2}{3}$ of the respondents choosing extremely useful.

New Student Orientation for Incoming Engineering Students (NSO)

The New Student Orientation sessions were held as a part of the College time during the eight orientation sessions held during the summer. Each session had approximately 75 participants. The time allotted for these sessions was significantly shorter than the previous sessions at only half of an hour. This was the first time that we had been invited to offer a DEI session during NSO, so understanding that the conditions were not ideal, we endeavored to adapt the workshop to fit both the time and the audience.

We maintained the design principles we had adopted from the literature to provide an informational introduction followed by an interactive session. We had an additional objective to let the participants know about the services provided by the Women and Minority Engineering Program (WMEP), particularly since the meeting room was next door to the WMEP student lounge and our offices. Although this was a daunting task, we undertook to provide some exposure with the hope that the first year engineering curriculum would carry the themes forward.

The opening to the session was “Why do we need to be sure everyone is at the table?” We used the examples of airbag design and gender, automatic soap dispensers and skin tone, and soap dispenser/sink design and wheelchair-bound persons. This was an approach like that in design principle number two of placing DEI in context related to their starting to study engineering.

After an introduction to WMEP, we then introduced two scenarios. We divided the room in half and asked each half to take a scenario. Students were instructed to discuss the scenario in groups of three and that they would be called upon to share their thoughts after 10 minutes. After three groups from each scenario were called on to share, comments were solicited from the entire room. Students were engaged to a variety of degrees, but most of them seemed to be participating as the facilitator walked around the room.

The scenarios used were:

1-You are working on a group design project. There is no one else like you in the group and you’ve felt a little uncomfortable in team meetings. They don’t seem to listen when you make a contribution to the discussion and you recently found out they had a project meeting, but didn’t inform you. A large part of your course grade is based on peer evaluations. What do you do?

2-You are in a class with a friend who shared that they use they/them pronouns. The instructor commonly ignores this preference and refers to the student as “he.” The student has withdrawn and stopped speaking in class. What do you do?

We concluded the session in the same way we had the other two, with the graphic of the baseball game. We were unable to collect student impressions immediately after this session, so had to

rely on our observations of level of student engagement. Not every student was engaged, but most were.

Assessment

An assessment was conducted with the participants in each of the three workshops six months after the sessions. Participants were asked to recall their impressions of the workshops, with the thought that what they remembered after six months would give an indication of the effects of the workshops.

Bezrukova et. al [1] noted that diversity training could not be concluded to have long lasting effect on affective or skill-based behaviors, but could affect long-term cognitive behavior. They were unable to identify a reason for this finding. We therefore hypothesized that thinking about DEI would be a more common response to the training than changing behaviors, reported six months out from the training.

The responses from participants are outlined in the following sections, beginning with a graph of the number of respondents from each type of training in figure 3. It must be noted that we were unable to identify which first year engineering students participated in the DEI sessions, so we solicited responses from all first year students. That is why some of the students identified that they did not participate in the training. Of course, some of the students who participated may have forgotten, but we were unable to tease out those differences.

I participated in:

118 responses

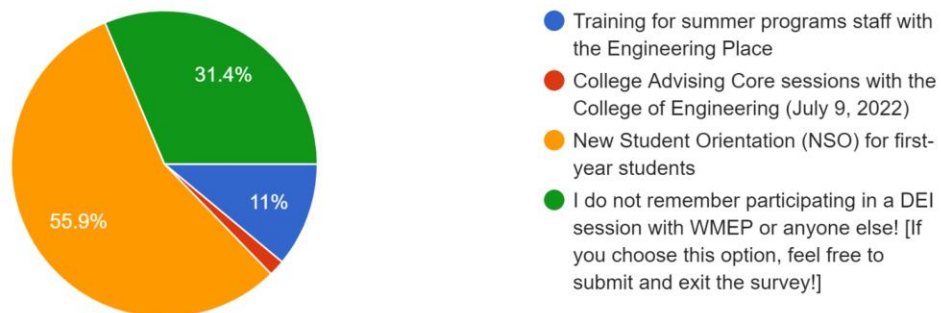


Figure 3: Distribution of responses to survey

Because the response rate was low for the College Advising Core, we do not report the results. We looked into why the response rate was so low, and we found that the teachers in these positions have a high turnover rate. This may explain why there were so few responses.

The questions in the survey are included as an appendix to this document. The first two graphs below show the responses to questions where participants were asked to recall their behavior before and after the trainings.

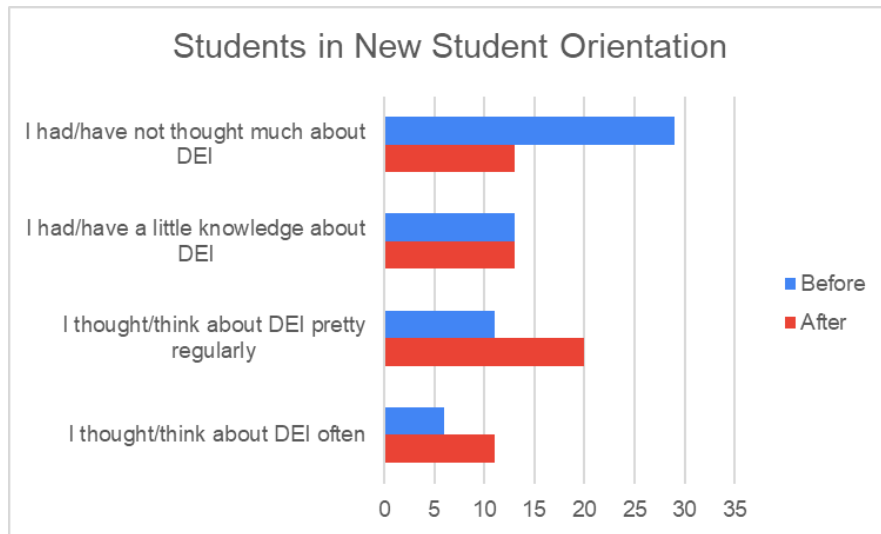


Figure 4: Number of students reporting agreement with statements before and after the training

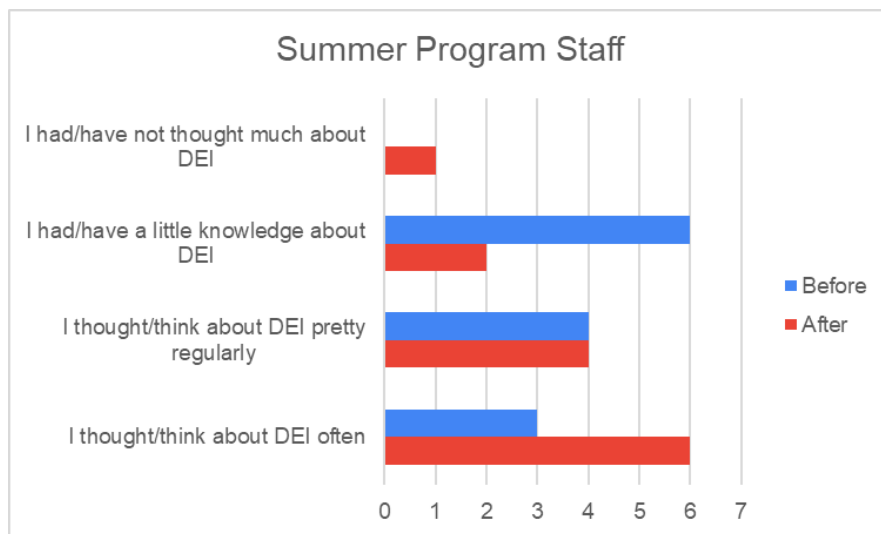


Figure 5: Number of staff reporting agreement with statements before and after the training

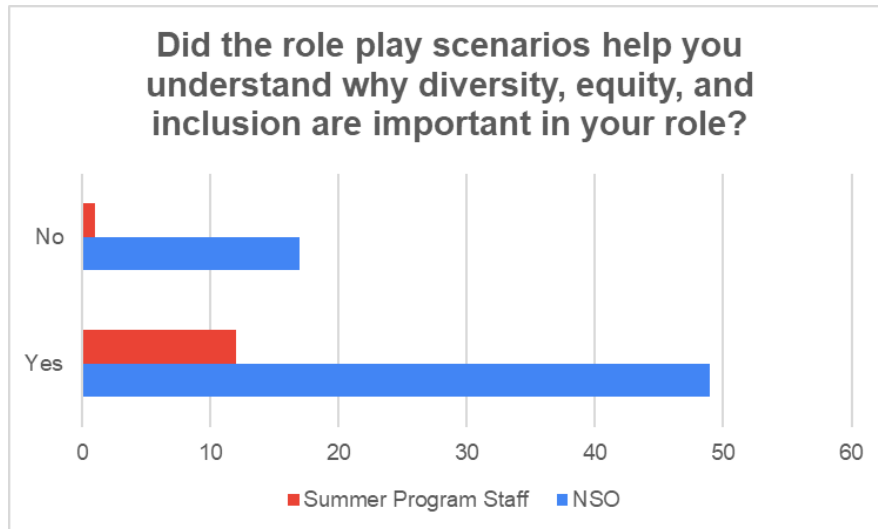


Figure 6: Number of participants answering yes or no, by program

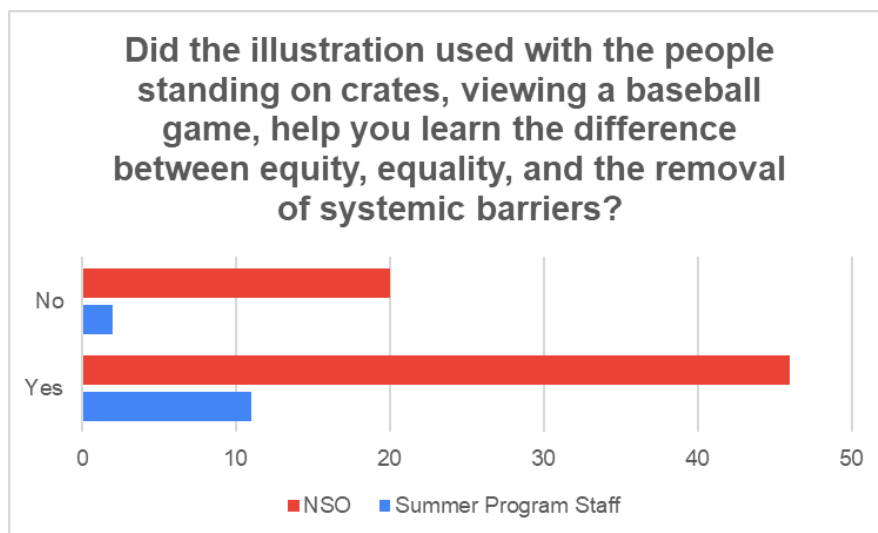


Figure 7: Number of participants who found the illustration helpful, by program

The results for both NSO and TEP Summer Program participants indicate that a significant portion of the participants report that they think about DEI more since the session. The TEP summer program staff were in the situation of using what they had learned for the week after the training program. The first year students left campus after NSO, so they may not have been prompted to think about DEI. However, upon their enrollment, all new engineering students enroll in First Year Engineering classes, which include discussions of DEI as a part of discussing the NAE Grand Challenges for Engineering [5].

The proportion of NSO students responding that the role-play scenarios were not helpful is higher than that of the TEP summer program staff. We ascribe this to the fact that the students were less motivated to participate in the training than the TEP staff. This result was expected, but nearly three fourths of the students still reported finding the session useful.

The next set of data comes from asking participants to choose words that describe how they remember feeling before and after the training session. Figures 8 and 9 show the words selected by students in New Student Orientation (NSO) as they recall feeling before and after the session respectively. The survey suggested words and allowed students to add their own.

Before the session half of the students reported feeling excited or curious, while half were nervous, anxious, annoyed, uninformed, or felt the session didn't apply to them. After the session, approximately 80% of the students reported feeling engaged, interested, better informed, or surprised in a good way. Of these students, 20% reported feeling bored, angry, or that the session didn't apply to them. This was interpreted as a positive response to the session, as recalled six months after the session.

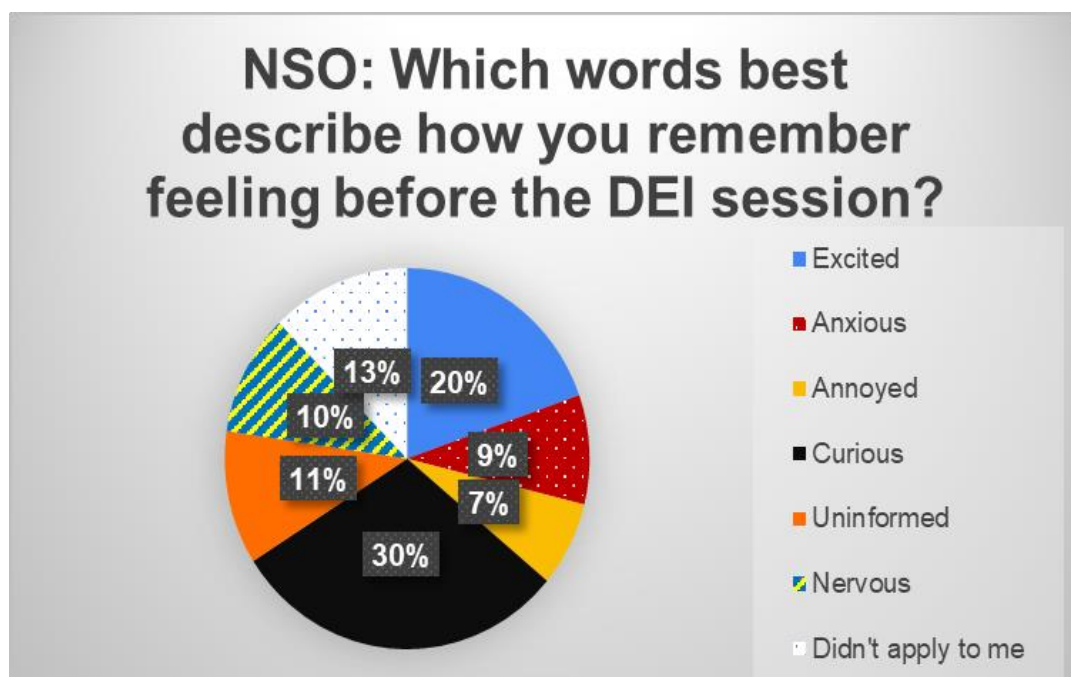


Figure 8: NSO students report words that they recall describing their feelings before the DEI session



Figure 9: NSO students report words that they recall describing their feelings after the DEI session

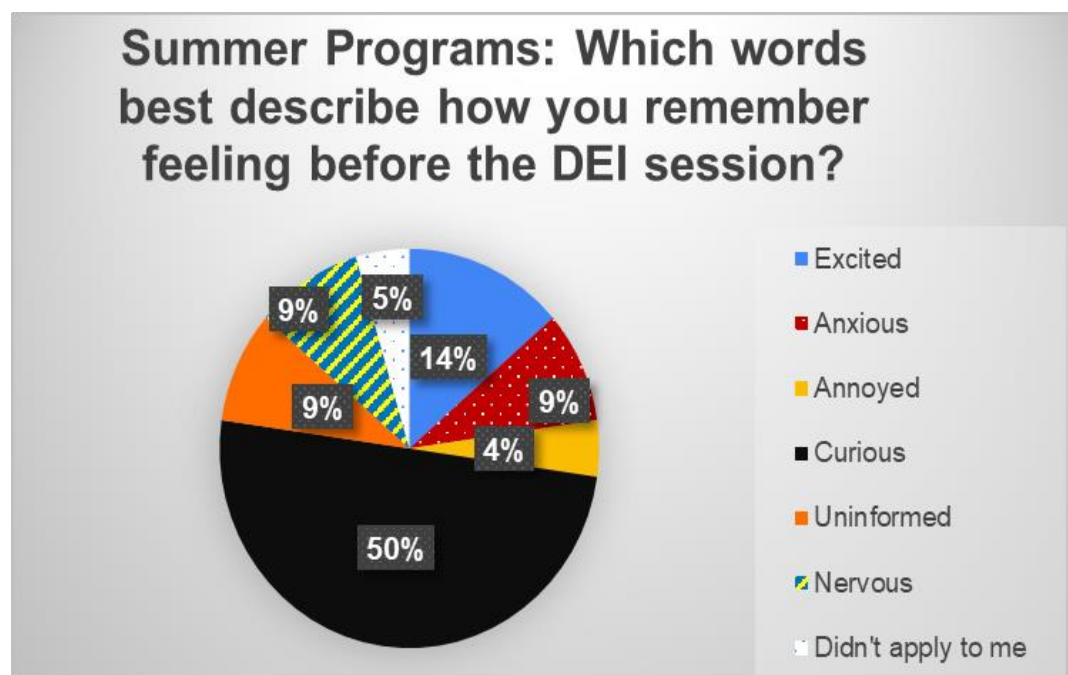


Figure 10: Summer programs (TEP) staff report words that they recall describing their feelings before the DEI session

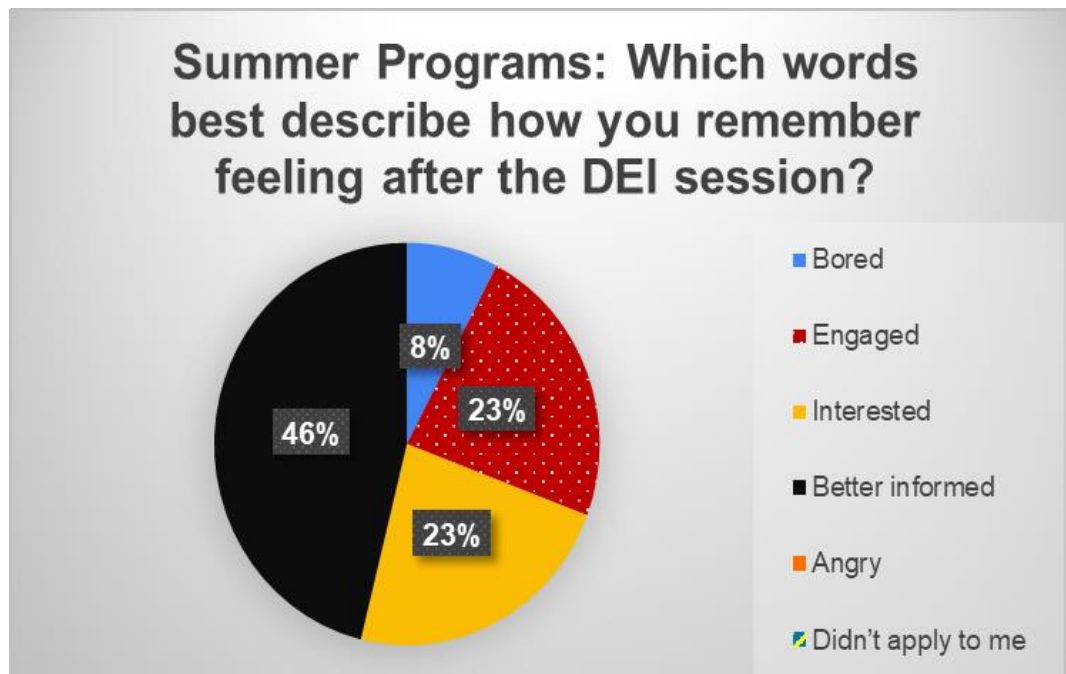


Figure 11: Summer programs (TEP) staff report words that they recall describing their feelings after the DEI session

The Summer Programs (TEP) staff results differed from those of the NSO students, as expected. Before the workshop, 36% of the participants reported feeling anxious, annoyed, nervous, uninformed, or that it didn't apply to them. After the workshop, only 7% (N=2) participants reported feeling bored, with none reporting feeling angry or that it didn't apply to them. 92% of the participants reported feeling better informed, interested, and engaged. Although these participants were expected to be more motivated to be engaged in the workshop, since it was a job-specific requirement, this was viewed as a very positive outcome.

The final piece of the assessment asked participants whether they had changed their thinking or their behavior based on anything brought up in the workshop, or whether they had thought about the workshop since. We hypothesized that participants would report less change of thinking, as thinking aligns with the affective domain identified by Kraiger et al. [3], which should be the most difficult to affect in a short term training.

The responses from the engineering first year students in NSO are depicted in figure 12, while the responses from the summer programs staff are in figure 13.

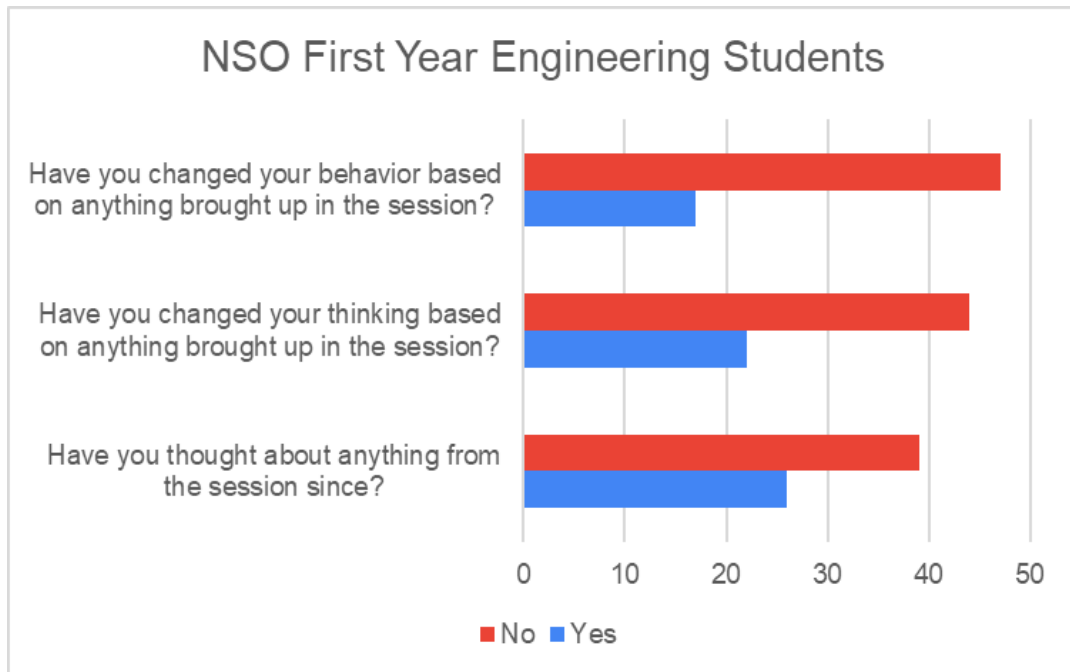


Figure 12: Number of engineering students participating in New Student Orientation in summer 2022 responding no/yes to each question about behavior and thought change, as recalled six months after training

Forty percent of the students said that they had thought about something from the session in the time since. One third said they had changed their thinking, and 27% said they had changed their behavior. Note that the question does not ask about how behavior or thinking changed. This leaves room for some of the student participants to have already been positively oriented toward DEI thinking and behaviors, and therefore have not changed. For example, seventeen of the students said they thought about DEI either often or pretty regularly before the session.

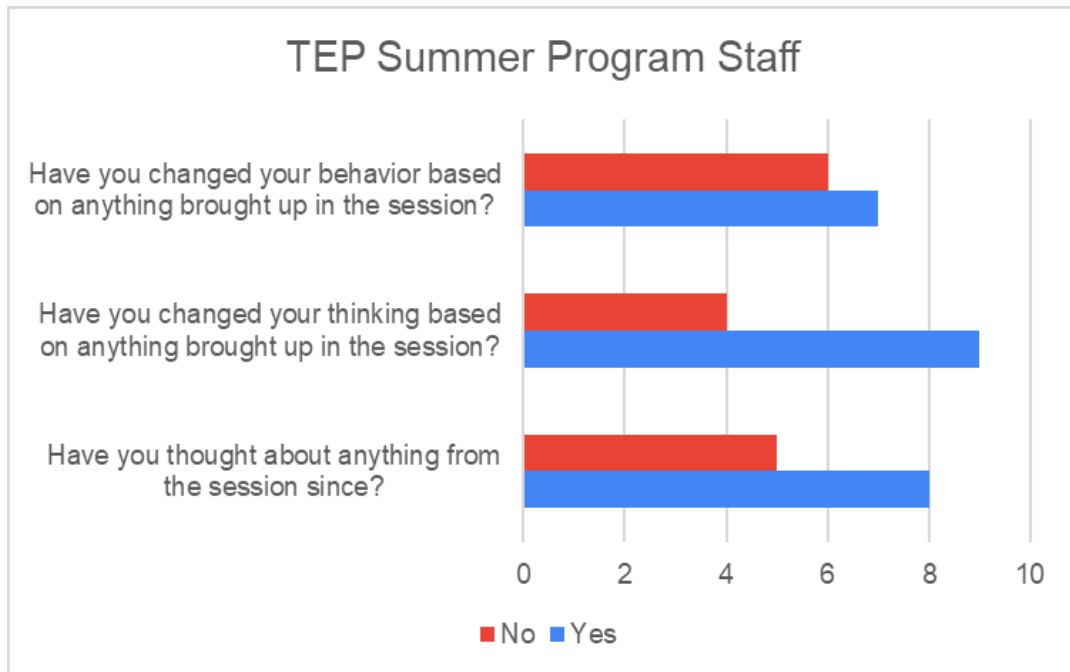


Figure 13: Number of summer programs (TEP) staff in summer 2022 responding no/yes to each question about behavior and thought change, as recalled six months after training

The responses from the summer programs staff were considerably different from those of the NSO students. Sixty-one percent of the respondents said they had thought about DEI since the session. Of those that said they had not thought about DEI, only two reported not having changed their thoughts or behavior. Sixty-nine percent (69%) of the participants reported that they changed their thinking after the session and 54% said they had changed their behavior.

These answers are also biased in that we did not assess behavior or thought orientation before or after the workshop. On the other hand, as the participants were placed in the role of teacher, their session contained more attention to skill-based learning outcomes.

Conclusions

A quick Google search on the phrase “Does diversity training work?” will yield an array of responses in the media, such as the New York Times[6] or the Washington Post [7], that question the value of diversity training, particularly short term training. But in practice, DEI practitioners know that the time available to provide training around DEI to a broad audience is severely limited.

Reading works like Noon, 2018, can inspire conclusions that all efforts are equally pointless, but that is not the message. Looking at what makes training ineffective can leave room for finding ways of being effective. Looking at training instances as part of a continuum of learning and practice can influence design, as well.

One limitation of this work is that we did not attempt to disaggregate the types of diversity that we addressed. Our examples were drawn from gender, race/ethnicity, LGBTQ+ status, and ability. It may be that effectiveness would vary across these broad categories.

These trainings were each very short and part of longer events, but the participant reflections from six months later show an effect on affective, skill-based and cognitive dimensions of understanding DEI. With attention to workshop design using currently available psycho-social and learning theory, we have the opportunity to have influence. If the message is institutionalized, that influence can build over time, resulting in the positive societal results that we hope for. Repeated reminders, experiences, and workshops will be more effective in the long term, but this work shows that it is possible to have influence with a single training, particularly where what is learned is immediately put into practice.

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Appendix

Survey Questions (Anyone who desires to use these questions is welcome to do so. We would be interested to hear if so.)

You are receiving this survey, because you may have participated in a session on Diversity, Equity, and Inclusion with the ***Women and Minority Engineering Program (WMEP)*** as a part of one of the following: 1) training for summer programs staff with the Engineering Place 2) the College Advising Core sessions with the College of Engineering or 3) as a part of New Student Orientation (NSO). Please indicate whether you remember this session by choosing one of the sessions below.

I participated in:

1. Training for summer programs staff with the Engineering Place
2. College Advising Core sessions with the College of Engineering (July 9, 2022)
3. New Student Orientation (NSO) for first-year students
4. I do not remember participating in a DEI session with WMEP or anyone else! [survey would exit at this point]

Did the role play scenarios help you understand why diversity, equity, and inclusion are important in your role?

1. Yes
2. No

Did the illustration used with the people standing on crates, viewing a baseball game, help you learn the difference between equity, equality, and the removal of systemic barriers?

1. Yes
2. No

Which words best describe how you remember feeling before the DEI session?

1. Excited
2. Anxious
3. Annoyed
4. Curious
5. Uninformed
6. Nervous
7. Didn't apply to me
8. Something else:

Which words best describe how you remember feeling after the DEI session?

1. Bored
2. Engaged
3. Interested
4. Better informed

5. Angry
6. Didn't apply to me
7. Something else:

Have you thought about anything from the session since?

1. Yes
2. No

Have you changed your thinking based on anything brought up in the session?

1. Yes
2. No

Have you changed your behavior based on anything brought up in the session?

1. Yes
2. No

Multiple choice grid:

Before the session	I had not thought much about DEI	I had a little knowledge about DEI	I thought about DEI pretty regularly	I thought about DEI often	I considered myself an expert in DEI
Since the session	I have not thought much about DEI	I have a little knowledge about DEI	I think about DEI pretty regularly	I think about DEI often	I consider myself an expert in DEI

Do you think the content in the session was sufficient?

1. Yes
2. No

Do you have any suggestions that can help improve the session or other comments? Please share.