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HOW DIVERSE ARE GLOBAL PERSPECTIVES ON DIVERSITY, EQUITY, AND INCLUSION IN ENGINEERING EDUCATION?

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ABSTRACT

The SEFI Special Interest Group on Gender & Diversity has recently been renamed as Diversity, Equity and Inclusion, broadening the definition from a focus on gender

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to embrace a wider range of diverse identities – such as language and cultural background, religion, physical ability, and socioeconomic status – and to promote and support equity and inclusive practices within SEFI and beyond. In the process of redefining the Special Interest Group’s mission, it has become clear that definitions of diversity, equity and inclusion may vary considerably between different contexts and institutions. Therefore, it is relevant for the engineering education community to share and examine how these terms are understood and implemented in their own institution and in other contexts around the globe. In this workshop, invited panelists from different continents and countries (United Kingdom, United States of America, Venezuela, South Africa, People’s Republic of China), and representing different engineering education communities across the globe (SEFI, American Society for Engineering Education, Research in Engineering Education Network, South African Society for Engineering Education) presented their perspectives and experiences on diversity, equity and inclusion. This was followed by small group discussions, during which SEFI 2023 participants examined their personal and the panelists’ perspectives with the facilitators. Several main conclusions emerged from these exchanges, all imbued with the awareness that context is crucial and that sustained dialogue with stakeholders across cultures and continents through various channels within and beyond the Special Interest Group of SEFI should be supported.

1 BACKGROUND AND RATIONALE OF THE WORKSHOP

Diversity, equity, and inclusion have increasingly become highlighted within engineering education today in Europe (Direito et al. 2021) and beyond (London, Murzi, and Litzler 2022). The SEFI Special Interest Group [SIG] Gender & Diversity has recently been renamed as Diversity, Equity and Inclusion [D-E-I], broadening the definition from a focus on gender to embrace a wider range of characteristics and identities. These characteristics include but are not limited to language and cultural background, religion, physical ability, and socioeconomic status (SEFI n.d). In the process of redefining the SIG’s mission, it became clear that definitions of D-E-I can vary considerably between different contexts and institutions. This observation confirms the results of a study by Pineda and Mishra (2023), who conclude on the basis of a computer-assisted content analysis of 2378 academic publications that ‘diversity’ has become a dominant theme only in some regions across the world and that where it appears, the concept has been interpreted in different ways, sometimes according to the discipline in which it occurs. In addition, ‘diversity’ policies in higher education have increasingly become a focal battleground for emancipatory forces and culture warriors alike (e.g. Harris 2018; Powell 2023; Saul 2023).

Therefore, it is important and timely that the engineering education community share and examine how ‘diversity’ and cognate terms are understood and implemented in their institutions and in engineering education contexts around the globe. As an initial step in this exploration, the SEFI SIG D-E-I put forward the workshop that is reported on in this contribution as its designated workshop for the annual SEFI conference held at TU Dublin on September 11-14, 2023 (<https://www.sefi2023.eu/>).

2 WORKSHOP OBJECTIVES

The one-hour workshop was designed so that participants could attain the following three objectives:

- i. an increased awareness of how D-E-I is understood and implemented in a variety of engineering education contexts around the globe;
- ii. a deeper insight into what elements are foregrounded in D-E-I policies and practices in their own institutional context and what is common or left out in comparison with engineering education contexts elsewhere; and
- iii. a keener idea of how participants could act in their local engineering education context to realize the values of diversity, equity and inclusion.

3 WORKSHOP DESIGN

The workshop session included the following steps.

1. Introducing the workshop objectives, structure, and facilitators;
2. Collecting initial participant perspectives on the following two questions, whereby participants entered their responses in the open response format on Mentimeter (mentimeter.com).
 - i. What does diversity mean to you?
 - ii. What is important about diversity to you?
3. Invited panelists from different continents presented their perspectives on D-E-I. The panel included the following notable speakers:
 - *Fiona Truscott and Natalie Wint* (University College London, U.K.); Co-chairs of the SIG D-E-I of SEFI;
 - *Homero Murzi* (Virginia Tech, U.S.A.); Past Chair of the American Society for Engineering Education (ASEE) Commission on D-E-I, Incoming Chair of the Research in Engineering Education Network (REEN);
 - *Karin Wolff* (Stellenbosch University, South Africa); President of the South-African Association of Engineering Education (SASEE);
 - *Xinrui XU* (Huazhong University of Science and Technology, P.R. China); Researcher in engineering education and curricular development.

Except for the last-mentioned speaker, who had pre-recorded her contribution, the panelists were present in the room. All speakers were invited to respond to the following questions.

- i. To your knowledge, how prominent has D-E-I been in recent times in the discourse on engineering education in your region?
 - ii. In your experience, which D-E-I issues have been at the forefront of people's attention in your region in engineering education?
 - iii. In your opinion, what have been the achievements and weaknesses of the current discourses and actions around D-E-I in engineering education in your region?
4. Small group exchanges, during which participants examined their personal and the panelists' perspectives with the facilitators acting as note-takers. The guiding questions for these small group exchanges were as follows:

- i. How did the panelists' views and experiences resonate with your own views and experiences?
 - ii. Was there something that helps you to think about or act in your own institutional context?
5. Conclusions to the workshop: main takeaways and the road ahead.

4 WORKSHOP RESULTS

The workshop was attended by approximately 50 participants and 7 facilitators / panelists.

4.1 Initial participant perspectives on diversity

The question 'What does diversity mean to you?' yielded 41 responses. The following synthesis statement is our attempt to combine the various elements of the answers we received into one full sentence.

Diversity is... bringing together people from a variety of backgrounds, with different experiences and perspectives, valuing their unique qualities as equal to our own by listening to their voices and considering them as resources for enhanced creativity and as gifts for greater joy.

Quite some responses specified one or more dimensions of diversity. These responses covered all categories of the traditional 'Big 8' model for classifying human variation in higher education (Plummer 2003) with the exception of sexual orientation: ability (mental/physical); age; ethnicity and nationality; gender; organizational role and function; race; religion. In addition, participants referred to dimensions of diversity in culture; disciplinary background; language; learning style; and upbringing.

There were 58 responses to the second question, 'What is important about diversity to you?' (participants could submit more than one response if they chose to do so.) Overall, these responses demonstrated that participants realized the close interconnections between diversity, inclusion, and equity. Many responses referred to the importance of feeling welcome; included; recognized; respected; affirmed; and valued. Participants also pointed out the significance of leveling the playing field and giving everyone a fair go. Justice, democracy, and kindness were some of the values that were named. Other responses drew attention to the fact that diversity requires critical self-reflexivity; awareness of privilege; the ability to deal with emotions and discomfort; and empathy.

4.2 Panelist perspectives on Diversity, Equity, Inclusion

Fiona Truscott and Natalie Wint, Co-chairs of the D-E-I SIG of SEFI, explained that with the SIG they would like to focus on gaining a better understanding of what priorities there might be in different national and institutional contexts. Within Europe, D-E-I in engineering education has been primarily focused on gender. Although this remains an important issue, the SIG has changed its name this year to widen the scope to different aspects of identity and personal background. Awareness of D-E-I in engineering education in Europe has been on the rise and has increasingly been

comprised in legal and accreditation frameworks. It has also been incorporated into agendas for sustainability, social justice, or global competences. However, the co-chairs regretted that there is also a discourse that puts an economic focus as the reason for increasing diversity and they stated that an increased attention to intersectionality would also be welcome. They applauded the fact that the workshop offers a forum for discussion and concluded that the SEFI SIG can take follow-up action.

Homero Murzi, Past Chair of the ASEE Commission on D-E-I and Incoming Chair of REEN, offered both a North-American and a Latin-American perspective to the panel. He narrated how being a Latino man in Venezuela only became a salient feature when he moved to the US. Contextuality has been a determining factor in his personal experience. In Venezuela, he researched how to make classrooms more inclusive, for instance towards students who feel they have to hide aspects of their identity that go against norms in society. Moving to the US he acknowledged he needed several years to understand what particular diversities meant from a US historical perspective and realized how even within the country, context makes a difference. On the positive side, he recognizes there has been substantial funding for research on broadening participation and the inclusion of particular groups both in the US (the Latinx space; the Afro-American experience ...) and in Venezuela (e.g. specific indigenous groups). However, he regretted that sometimes we prescribe solutions that have not fully involved the people being affected by them. He also deplored the fact that research into teaching over the past thirty years has often not been translated to the classroom, resulting in a cycle where the same issues reappear again and again. Lastly, he wished that basic values of being human, kind, and empathetic gain wider recognition.

Karin Wolff, President of SASEE, indicated that in the South African context, D-E-I is embedded within a wider national transformation program. Based on a constitution that recognizes the past injustices under the apartheid era and upholds human dignity, the National Planning Commission of the Presidency of the Republic of South Africa (2012) developed a comprehensive national development plan for a structural socio-economic transformation of the country. In contrast to many other contexts where the protection of minorities is at stake, apartheid brought about a radical discrimination of the majority of the population. In engineering education, this transformation has already resulted in structural achievements on the ground, including a revised national qualifications framework, foundation programs, academic literacies programs, and other community engagement programs. However, she indicates that coordination between these programs has been neglected and major problems persist in reality. In terms of enrolment in engineering education, substantial progress has been made concerning the participation of females and the non-white population. Graduation statistics show a starkly different picture, though, as female professionals and black graduates remain vastly underrepresented. A number of additional burning issues need to be addressed as well, including the engagement of students in the transformation processes and a sustained decolonization of the curriculum.

Xinrui XU is an engineering educational researcher at HUST in China and a former career service consultant for university students at Purdue University. She also speaks as a former international student in the USA, a perspective she describes as

a D-E-I experience on a daily basis (see also Xu, Wei, and Cao 2023). She explained that in engineering education in China, women's issues are most prominent in the discourse although they may not be framed within a D-E-I framework. Women live with the knowledge and the fear that they will fall behind when they decide to get married and have a child. Employers commonly assign women with less central and less challenging tasks because they expect that they will take care of their family at some point. As a result, it is almost impossible for female engineers to compete with their male counterparts. The fact that there are so few female role models and leaders exacerbates the situation. She hopes that her research will shed further light on these issues.

4.3 Small group exchanges on D-E-I

Participants formed self-organized groups of about 4 people. Each facilitator and panelist joined a group to take notes on a Padlet form (<https://padlet.com>). Several main conclusions emerged from these exchanges, all imbued with the awareness that context is crucial.

- Gender balance remains a burning issue in engineering education yet in some institutions, gender is not seen as part of diversity efforts.
- Some aspects of belonging merit closer attention than they have received so far, including the inclusion of international students (alongside domestic minority groups), or students in a school environment where the dominant language or favored learning style is experienced as foreign.
- Conversations about D-E-I have become increasingly polarized and politicized. In some parts of the USA, D-E-I policies and practices today face legal obstacles.
- A well-known pitfall for D-E-I is that it risks becoming a purely technical matter of checking boxes and token inclusion. This can give the organization a false sense of achievement of inclusion. What is needed instead is a genuine and sustained conversation, the abolition of exclusive systems and practices, and the introduction of integrated support approaches.
- Change starts on the ground; therefore it is crucial to remove ignorance and raise awareness of diverse diversities at the institutions. The question is asked whether this should be provided as optional or compulsory professional development for educators.

5 CONCLUSIONS

This paper reported on the dedicated workshop of the SEFI Special Interest Group 'Diversity, Equity and Inclusion' at the first annual conference since its name was changed to reflect a more comprehensive interest in diverse diversities. Together, workshop participants unpacked their understanding and experiences of D-E-I in their respective engineering education contexts. Testimonials from an expert panel drew attention to D-E-I practices and experiences in Europe (UK and SEFI SIG DEI community), Latin America (Venezuela), North America (USA), Africa (South-Africa) and Asia (P.R. China). Tokenism and whitewashing (an apt term given that white light combines the full diversity in the color spectrum) were condemned in favor of a genuine on-going dialogue involving all stakeholders and concerted action. Context emerged as a critical factor, recognizing the cultural legacies and power relations of

each context. There are indeed diverse perspectives on diversities and the conversation is conducted in various languages.

We can sense a keen awareness that this workshop was just the first step in a joint pursuit to gain a deeper insight into the discourses on diversity, equity and inclusion in engineering education around the world. In the authors' eyes, this is not just an academic exercise but a praxis, a 'situated practice which must include morally grounded action aimed at fairness and justice' (Ladegaard & Phipps 2020, 75). We are consequently committed to engaging in a sustained dialogue with stakeholders across cultures and continents through various channels (conferences; webinars; podcasts; publications ...) within and beyond the Special Interest Group of SEFI. And we hope dearly that you will join us and let your voices be heard.

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