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Examining Perceptions of Engineering Work and Identity across Generations in the USA

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Engineering identity is a complex highly fluid construct based heavily on the perceptions and understanding of engineering work held by engineers and others. It is believed that perceptions surrounding engineering and engineering identity play an important role in both engineering education and engineering practice. This is based on the notion that engineering identities affect student interest in engineering careers, contribute to a society's technical literacy, influence the value placed on engineering, and shape positions on innovation excellence [1]. However, very few studies have contrasted perceptions of engineering work and understandings of engineering identity across generations. Understanding how novice developing engineers (students) perceive engineering can provide insights into what attracts students into engineering as well as what might be repelling them from the field. This

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stands in contrast to perceptions of engineering among practitioners of older generations. Unfolding a complete view of these perceptions across developmental stages of engineering can deepen our understanding of identity formation and inform discussions of recruitment and retention.

1. METHOD AND RESULTS

This study compared the perceptions of engineers and engineering work held by engineering students at a large American university and practicing engineers from over 40 industrial firms across the United States. Over 300 engineering students and over 400 practicing engineers responded to surveys asking them to select words describing their workplace and other engineers. The top five words most frequently chosen as representing engineering for field practicing engineers includes: technical, detail oriented, hard working, team oriented and innovative. In contrast engineering the top five words chosen by engineering students were: thorough, detail oriented, competitive, independent and confident.

2. DISCUSSION AND CONCLUSION

Engineering as an identity is not homogeneous; rather each unique engineering discipline brings with it a unique engineering culture, set of attributes and values. In addition it is evident that the perception of engineering identity and culture differs among engineering students and engineering practitioners and across the generations that responded to the surveys. Acknowledging the subtle or not-so-subtle differences between engineering discipline identities can allow secondary school and university advisors to more directly guide students toward a discipline of engineer education that is most closely aligned with their own attributes and value systems. The least represented descriptors such as extrovert, entrepreneurial and artistic are frequently associated with entrepreneurial interests and endeavours. This research seems to reinforce the void of these attributes amongst working engineering professionals, and the need for developing these attributes in the next generation. ■

REFERENCES

- [1] Giddens, D.P., et al., *Changing the conversation - Messages for improving public understanding of engineering*. 2008, National Academy of Engineering of the National Academies: Washington, DC. p. 1-149.