How Do I Understand Them? Integrating Empathy into Course Design through Personas

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***Abstract*— Literature from neuroscience and educational psychology are continuously underscoring the importance of emotion in learning, which brings considerable implications for education. While some areas, such as design thinking, have embraced empathy as a technique for better connecting design with user need, empathy as a construct still remains ambiguous. In addition, many course design theories and frameworks focus heavily, if not exclusively, on cognitive processes; apprenticeships of the head and hands. Educators hoping to intentionally and systematically engage in empathetic strategies, or apprenticeships of the heart, have little guidance from traditional course design models for doing so. The special session will introduce one tangible method to engage in and integrate empathy into course design.**

Keywords—Empathy in Teaching, Personas, Special Session

I. Purpose Statement

This session will provide a systematic framework--leveraging insights from psychology, empathic design, and engineering education research--to integrate empathy into course design that can support a more inclusive and effective learning environment for everyone.

II. Background

In recent years, scholars and practitioners have paid increased attention to the role of empathy in engineering. While some of this focus has been on the expanding role empathy plays among both students and professionals when engaging in engineering practice [1]–[5], others suggest a more deeply seeded empathic lens that educators and students might bring to the engineering education system [6]–[8]. Empathizing with users is an important, carefully integrated aspect of many design processes [9]–[12], but one that might be overlooked when designing engineering courses [13]. Many educators may instinctively think about their audience and characteristics of their students but may not consider the unique needs of groups to which they do not belong and are not connected [13]. Such empathic oversights or lapses can lead to marginalization of specific groups within a learning environment or course.

III. Session Overview and Agenda

A significant degree of the content of this special session will be participant driven, based on the types of courses and student populations they typically work with and/or choose to focus on during this session. While this session is designed for interactive group discussion, given the current circumstances surrounding the global COVID-19 pandemic, this session could be facilitated in-person, or through a virtual environment, such as zoom, or any video conferencing app that allowed for break-out groups. Should a virtual conference become necessary, we plan to make minor modifications agenda for facilitation, but the overall objectives and anticipated outcomes will remain the same.

A. Conceptual Orientation (10 Min.)

The session will begin with an orientation of a systematic design approach that mirrors familiar engineering design processes. This orientation will feature an overview of the construct of empathy and how it is enacted in design contexts at both the procedural and mindset levels. We will also discuss several concrete tools and strategies for enacting empathic procedures and mindsets, which will be learned experientially during the remainder of the session.

B. Icebreaker & Group Organization (10 Min.)

Participants will then engage in an icebreaker activity to prepare them for the collaborative experience and help organize groups around common interests. Participants will be asked to briefly reflect on their students, especially those they have had trouble connecting with or are interested in empathizing with, and then share those reflections with the larger group. We will form emergent groups around themes in participant responses and participants will self-select a group to join for break-out discussions throughout the remainder of the session. Group size will depend on the number of participants, but are expected to be between 3-6 participants per group.

C. Generate Empathy Maps (20 Min.)

In small groups, participants will collectively generate empathy maps related to the students group(s) they have selected. An empathy map asks designers to compile their observations and information about users (e.g., students) on a simple, four-quadrant visualization. This visualization asks designers to separate things they've seen users do, heard users say, experienced users think, and observed users feel. By

separating these aspects and then connecting across them, designers develop a more nuanced awareness of user experiences in the design context. This will conclude with a brief report out from each group.

D. Generate Thematic Personas (25 Min.)

The small groups will next use their empathy maps as the basis for student personas. Personas represent composite users that can be used throughout the design process to orient designers based on key features of their users and users' experiences. First, participants will identify themes across the sections of their empathy maps. These themes will be used to generate statements of user needs and then developed into more complete personas. Each group will sub-divide into pairs (if feasible) with the aim to identify and describe 2-3 personas based on their group's empathy map.

E. Connections to Teaching and Next Steps (10 Min.)

The session will close with a discussion of connections between personas to teaching methodologies and/or interventions. The session moderators will share their experiences, insights for potential next steps, and encourage participants to consider and share how they might utilize empathy maps and personas in their own teaching/course design.

IV. Intended Audience

This session will be ideal for instructors and students at all levels. The session will provide a structured approach to empathic design that can be applied to any course. We encourage instructors from a broad range of institutions and backgrounds to investigate a new tool for integrating empathy and more deeply understand the students they teach. Undergraduate and graduate students can apply the objectives of this session to their work in teams, mentoring in professional societies, etc., and may appreciate the opportunity to reflect on their own learning experiences.

V. Expected Outcomes

Participants who engage in this session will broaden their toolbox of empathic course design techniques, discuss the applications of these tools in the overall course development process, develop a deeper awareness of the role and importance of mindset in course design, and develop an implementation plan to apply to their own courses.

During the session, participants will co-construct the following:

a) an empathy map contextualized for the kinds of students they typically work with (e.g., first-year, graduate students, adult learners, distance learners, etc.),

b) personas that thematically emerge from their empathy map, and

c) discussion of how empathic design practices can be integrated into classroom teaching and student mentoring.

VI. Session Facilitator Bios

Ruth Wertz is an Assistant Professor at Valparaiso University in the College of Engineering. Dr. Wertz is currently a Co-Principal Investigator on an NSF grant to investigate misconceptions and difficult concepts in the emerging data science field. Her scholarly interests focus on exploring classroom applications of research-based pedagogical frameworks, teaching methods for difficult concepts, assessment methods of student learning, and overall program/classroom effectiveness.

Nick Fila is a postdoctoral research associate in Electrical and Computer Engineering and Industrial Design at Iowa State University. He earned a B.S. in Electrical Engineering and a M.S. in Electrical and Computer Engineering from the University of Illinois at Urbana-Champaign and a Ph.D. in Engineering Education from Purdue University. His current research interests include innovation, empathy, engineering design, course design heuristics.

VII. Session Contributor Bios

Karl A. Smith is Cooperative Learning Professor of Engineering Education, School of Engineering Education, at Purdue University. He is also Morse-Alumni Distinguished University Teaching Professor and Emeritus Professor of Civil, Environmental, and Geo- Engineering at the University of Minnesota. He has been at the University of Minnesota since 1972 and started his academic career as a materials processing engineering researcher. In 1991 he changed careers to focus on engineering systems, project and knowledge management, and engineering education research. In 2006 he accepted a part time position as Cooperative Learning Professor, School of Engineering Education, Purdue University to help start the engineering education PhD program. His research and development interests include building research and innovation capabilities in engineering education; faculty and graduate student professional development; the role of cooperation in learning and design; problem formulation, modeling, and knowledge engineering; and project and knowledge management.

Ruth A. Streveler is a Professor in the School of Engineering Education at Purdue University. Dr. Streveler has been the Principal Investigator or Co-Principal Investigator of ten grants funded by the US National Science Foundation. She has served as Associate Editor for the Journal of Engineering Education (JEE), has published articles in the JEE and the International Journal of Engineering Education, and contributed two chapters to the Cambridge Handbook of Engineering Education Research. She has presented workshops to over 500 engineering faculty on four continents. Dr. Streveler's primary research interests are investigating students' understanding of difficult concepts in engineering science and helping engineering faculty conduct rigorous research in engineering education.

References

[1] N. D. Fila, & J. L. Hess, "Exploring the role of empathy in a service-learning design project," In Analyzing Design Review Conversations, R. S. Adams & J. Siddiqui, eds., West Lafayette, IN: Purdue University Press, pp. 135–154, 2015.

[2] R. Korte, K. A. Smith, & C. Q. Li, "The role of empathy in entrepreneurship: A core competency of the entrepreneurial mindset," Advances in Engineering Education, Fall, pp. 1–10, 2018.

[3] M. Kouprie, & F. Sleeswijk Visser. "A Framework for Empathy in Design: Stepping into and out of the User's Life." Journal of Engineering Design, vol. 20, no. 5, pp. 437–448, 2009. doi:10.1080/09544820902875033.

[4] J. Strobel, J. Hess, R. Pan, & C. A. Wachter Morris, "Empathy and care within engineering: Qualitative perspectives from engineering faculty and practicing engineers," Engineering Studies, vol. 5, no. 2, pp. 137–159, 2013, DOI: 10.1080/19378629.2013.814136.

[5] C. B. Zoltowski, W. C. Oakes, & M. E. Cardella, " Students' ways of experiencing human‐centered design. Journal of Engineering Education, vol. 101, no. 1, 28‐59.

[6] N. D. Fila, & J. L. Hess, "In their shoes: Student perspectives on the connection between empathy and engineering," in Proc. 2106 ASEE Annual Conference & Exposition, New Orleans, LA, 2016.

[7] J. L. Hess, & N. D. Fila, "The development and growth of empathy among engineering students," in Proc. 2106 ASEE Annual Conference & Exposition, New Orleans, LA, 2016.

[8] J. Walther, S. E. Miller, & N. W. Sochacka, "A model of empathy in engineering as a core skill, practice orientation, and professional way of being," Journal of Engineering Education, vol. 106, no. 1 pp.123–148, 2017.

[9] T. Brown, "Design thinking," Harvard Business Review, vol. 86, no. 6, pp. 84–92, 2008.

[10] L. Carlgren, I. Rauth, & M. Elmquist, "Framing design thinking: The concept in idea and enactment," Creativity and Innovation Management, vol. 25, no. 1, pp. 38–57, 2016.

[11] Koskinen, Ilpo, and K. Battarbee. 2003. "Introduction to User Experience on Empathic Design." In Empathic Design: User Experience in Product Design, edited by Ilpo, Koskinen, and K. Battarbee, 37–50. Helsinki: IT Press.

[12] C. Postma, E. Zwartkruis-Pelgrim, E. Daemen, & J. Du, "Challenges of doing empathic design: Experiences from industry," International Journal of Design, vol. 6, no. 1, pp. 59–70, 2012.

[13] N. D. Fila, S. McKilligan, & K. A. Geurin, "Design thinking in engineering course design," in Proc. 2018 ASEE Annual Conference & Exposition, Salt Lake City, UT, 2018.