WIP: Navigating Empathy in Engineering Teaching Within Institutional Contexts

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Abstract

This Work-in-Progress (WIP) paper examines teacher empathy as a critical yet underexamined dimension of engineering instructor's professional practice. While empathy is often discussed as a desired student outcome–engineering students are increasingly expected to develop empathy as part of their professional formation (Empathic Design)–far less attention has been given to how instructors interpret and respond to student needs while navigating expectations of academic quality, fairness, and institutional accountability. This study asks: How do personal, institutional, and disciplinary contexts shape the processes through which empathy is enacted or withheld in interactions between engineering instructors and students? Data are drawn from semi-structured interviews with engineering instructors across diverse contexts. Using thematic analysis, preliminary findings suggest that empathy functions as situated professional judgment involving interpretation of student cues, assessment of capacity and fairness, and negotiation of institutional constraints. These insights highlight empathy as a developable teaching practice with important implications for faculty development. *Keywords*: Teacher Empathy, Faculty Development, Engineering Education, Professional Growth.

Introduction

Engineering instructors are increasingly expected to respond to students not only as learners of technical content, but also as individuals navigating academic, emotional, and institutional pressures. Growing concerns around student well-being and persistence have heightened expectations that instructors demonstrate care, responsiveness, and flexibility in their teaching roles[1,2]. Yet empathy is rarely treated as a professional competence that can be intentionally developed or supported through faculty development.

In engineering education, these expectations often intersect with disciplinary norms emphasizing rigor[1], objectivity, efficiency, and performance. Such norms can marginalize relational and emotional dimensions of teaching, positioning empathy as a personal disposition rather than a contextual instructional practice shaped by institutional structures and professional expectations[3,4]. As a result, instructors frequently experience tension between supporting students and maintaining academic quality.

Prior research links empathic teaching practices to positive student experiences, including increased motivation, belonging, and persistence[1,5]. However, much of this work focuses on student perceptions or outcomes, offering limited insight into how instructors themselves understand empathy or how they decide when and how to respond empathetically amid constraints such as workload, grading policies, fairness concerns, and expectations of academic

[1]Due to the varied interpretations of the term *rigor*, this paper uses the term only when referring directly to participants' language. In the authors' interpretation, the term academic quality is used instead.

quality[6,7]. From a faculty development perspective, this gap is consequential, as empathy is often implicitly expected but structurally unsupported, contributing to uncertainty and strain for instructors[8,9].

This WIP study examines teacher empathy as a situated instructional practice within engineering education. Empathy is conceptualized as involving cognitive, emotional, and motivational dimensions that shape how instructors interpret student situations and decide how to respond[10]. This paper employs thematic analysis to identify recurring patterns in early interview data. The guiding research question is:

> **RQ1:** How do personal, institutional, and disciplinary contexts shape how empathy is enacted or withheld in interactions between engineering faculty and students?

Conceptual Framing

This study conceptualizes teacher empathy as a multidimensional and situated teaching practice rather than a stable personal trait. Across education research, empathy is commonly understood as involving interconnected cognitive, emotional, and motivational components that shape how instructors interpret and respond to students' experiences[10]. Empathy, from this perspective, includes understanding students' perspectives and circumstances, noticing and interpreting emotional cues, and making intentional decisions about how to respond within instructional contexts. Importantly, these components are enacted through professional judgment rather than affect alone. Prior work emphasizes that empathy in teaching unfolds in specific moments and is shaped by situational demands, instructors' background and capacity, and contextual constraints[8]. Empathy is therefore best understood as a process embedded in instructional decision-making rather than an automatic or purely emotional response.

Empathy in Engineering Education Contexts

Within engineering education, empathy is often enacted within competing professional expectations. Disciplinary norms that emphasize academic quailty, objectivity, performance, and efficiency can leave limited space for the relational and emotional dimensions of teaching, shaping what instructors perceive as legitimate instructional practice[4]. Research shows that engineering instructors frequently navigate the need to maintain academic standards and fairness while responding to students' academic, emotional, and personal challenges[6,7]. Consequently, instructors often balance empathetic responses with concerns about workload, consistency, institutional policies, and professional credibility. At the same time, changing student demographics and growing attention to inclusion and persistence have increased expectations for instructors to respond supportively to students[2], often without corresponding structural support.

Faculty Development Lens

From a faculty development perspective, empathy can be understood as a professional competence that requires reflection on one's experiences, awareness of students' personal and academic contexts, and supportive institutional conditions. Rather than treating empathy as an innate disposition, emerging scholarship frames it as a developable aspect of teaching practice[9]. Empathy also constitutes relational labor that is frequently undervalued or invisible within academic reward structures[8]. This study therefore distinguishes empathy as disposition from

empathy as practice, focusing on how empathy is enacted–or withheld–through instructional decisions and boundary-setting in real teaching contexts.

Methods

This WIP study uses a qualitative research design to examine how engineering faculty understand and navigate empathy in their teaching practices. Participants are engineering instructors with varied years of experience who teach undergraduate courses–both first-year and upper-level–across different engineering disciplines and institutional contexts, including research- and teaching-focused public and private institutions in the United States. The analysis presented here draws on an initial subset of five semi-structured interviews, selected to capture variation in teaching experience and context. Data were collected through 60-90 minute video-based interviews focused on instructors' interpretations of empathy, responses to student challenges, and contextual constraints. Interviews were audio-recorded, transcribed verbatim, and conducted with Institutional Review Board approval.

The analysis in this study employs thematic analysis[11] to examine recurring patterns of meaning in early interview data. Open and focused coding were used to identify shared patterns in how instructors enact, limit, or withhold empathy while navigating care, academic quality, fairness, and institutional expectations. Trustworthiness was supported through iterative coding, memo-writing, and reflexive attention to researcher positionality.

Results and Discussion

Codes were grouped into focused categories representing processes through which empathy is understood, enacted, and constrained. The findings are organized around four interrelated themes that illustrate how empathy operates as a form of situated judgment within instructional practice.

Theme 1: Empathy as Situational Judgment This theme emerged from focused codes such as *perspective-taking*, *understanding student life context*, and *reading students' emotions*. These codes clustered around instructors' interpretive work—how they notice cues, assess sincerity, and weigh contextual factors before acting.

Instructors consistently described empathy as an interpretive process requiring attentiveness and judgment, rather than an automatic response. Empathy involved recognizing student circumstances, assessing emotional cues, and deciding whether and how to respond. One instructor explained:

> "Typically, the way I decide whether or not to be empathetic is based on how the student presents their issue and reading the room."

This interpretive work included evaluating the sincerity of students' explanations:

> "I look at the level of engagement and whether this seems like a legitimate issue or challenge, or if they think they can ask and just get the extension anyway."

Similarly, another instructor emphasized intentionality in understanding students beyond academic performance:

> "Empathy, to me, means trying to understand my students on a broader level—not just as students... Being aware of all those things and being open to listening when they can't meet my expectations–that's empathy."

Empathy was described as a deliberate, context-sensitive process that involved interpreting student cues, considering their broader circumstances, and deciding how to respond within specific teaching situations. Perspective-taking and awareness of students' developmental stages were central to this process. This aligns with research framing empathy as a cognitive, emotional, and motivational construct enacted through professional judgment rather than disposition[3,5].

Theme 2: Constraints and Limits on Empathy Focused codes such as *time constraints*, *grading workload*, *institutional deadlines*, and *fairness considerations* informed this theme. These codes consistently appeared when instructors discussed why empathy was withheld or limited.

While instructors valued empathy, they highlighted structural and contextual constraints that shaped its enactment. Time pressure, grading workload, and institutional deadlines frequently limited flexibility:

> "I want to be empathetic and give them all these opportunities, but sometimes I don't have the capacity to actually do it..."

Concerns about fairness and perceived sincerity also influenced decisions:

> "...but fairness is definitely a consideration."

> "If I feel their struggle is genuine, I give them another chance."

Although instructors valued empathy, they described constraints that shaped when and how it could be enacted. Time pressure, grading workload, institutional deadlines, fairness concerns, and perceptions of student sincerity often limited support or flexibility. This pattern indicates that empathy is not simply a matter of willingness but is shaped by structural and relational boundaries. These findings suggest that institutional conditions often limit how empathy can be enacted., reinforcing prior work showing that empathy is negotiated within institutional and professional constraints[8,9].

Theme 3: Empathy Development Over Time This theme was informed by codes such as *empathy increasing with experience*, *empathy shaped by parenting*, and *learning empathy through policy*. These codes reveal that empathy is dynamic and evolves through professional and personal experiences. Instructors framed empathy as a capacity that can be developed and refined through experience, even when some individuals may already possess a natural disposition toward it.

Both instructors described empathy as evolving through experience, reflection, and personal life events. Parenting and exposure to institutional policies were cited as key influences:

> "As I've gotten older, I've become more empathetic... That's partially because I have my own children now..."

Similarly, reflective practice and prior negative experiences as students shaped empathy:

> "My experience of not receiving empathy made me want to be empathetic."

Instructors described empathy as evolving through professional experience, reflection, and personal life events. Teaching experience, parenting, institutional exposure, and prior negative or possitive educational experiences were cited as shaping how empathy was understood and practiced. Empathy was framed as a capacity that can develop over time, supporting calls to position it within faculty development as a skill that can be cultivated through reflection and experience[9].

Theme 4: Consequences of Empathy Decisions Codes such as *trust and rapport*, *improved student engagement*, and *inclusive learning environment* informed this theme. These codes highlight perceived outcomes of empathy for both students and instructors, reinforcing empathy's role in fostering relational and motivational benefits.

Instructors perceived empathy as fostering trust, engagement, and inclusive learning environments:

> "You see trust. You see genuine smiles... That's the biggest thing I've seen–a long-term connection."

Empathy was also linked to improved student motivation and instructor satisfaction:

> "If I can help them learn better, then I'll go ahead and do it."

Instructors linked empathetic responses to greater trust, stronger rapport, increased engagement, more inclusive classroom climates, and their own sense of professional satisfaction. They also emphasized that empathy does not mean lowering expectations, but making intentional judgments about when support best serves learning. These insights align with prior research linking empathic teaching to motivation, belonging, and persistence, while challenging the assumption that empathy undermines rigor[1,5].

Implications for Faculty Development

Taken together, these themes position teacher empathy as a form of situated professional judgment shaped by personal lived experiences, professional experience, institutional structures, and disciplinary norms. From a faculty development perspective, the findings suggest that empathy should not be framed only as an individual virtue, but as relational and cognitive labor that develops over time and is shaped by workload, institutional policies, and prevailing conceptions—or misconceptions—of rigor and fairness in engineering education. Faculty development efforts may therefore be more effective when they support instructors in making reflective decisions about how and when to respond empathetically, while recognizing the need for clear boundaries and shared responsibility across instructional and student support systems. As this WIP continues, these insights invite further discussion on how empathy can be more intentionally supported as a sustainable teaching practice in engineering education.

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