

WIP: Exploring the Nexus of Ethics and Empathy in STEM Higher Education through Faculty and Student Perspectives

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Abstract – This work-in-progress paper does not stem from specific research questions but rather emerges from secondary findings within a broader study on the culture of STEM ethics. Our focus is on exploring the connection between empathy and ethics, which became apparent as study participants often intertwined these concepts. The contribution of this paper lies in its exploration of the empathy-ethics relationship and its relevance to ethics education in STEM, offering insights that may enrich discussions and practices within the community. The primary study aimed to understand the components that constitute a culture of ethics, utilizing thirteen focus groups with students and faculty and guided by interview questions centered on culture of STEM ethics. However, upon analyzing the data, the researchers observed that participants often discussed empathy instead of ethics. In this work-in progress paper, we only focus on the emerging themes related to the construct empathy and begin to explore the relationship between ethics and empathy. Data analysis employing thematic analysis techniques, with a specific focus on identifying patterns and themes related to empathy and its intersections with ethics, is currently undergoing. Despite addressing an important topic, this study is still work-in-progress and does not yet yield significant results for broader conclusions. Further research is needed to assess how these dynamics evolve over time and across different contexts. Completing the study, including the ongoing analysis, will help address these limitations, and we outline the next steps for finalizing this work in the last section of the paper.

Keywords—empathy, ethics, university culture

I. INTRODUCTION

Empathy, often described as the ability to understand the thoughts, feelings, and experiences of others, is a

foundational ability in ethical decision-making and behavior. It catalyzes ethical behavior by enabling individuals to appreciate the perspectives and experiences of others. Empathy plays a pivotal role in fostering a compassionate and supportive environment within the university culture [1]. This work-in-progress study aims to explore the connection between ethics and empathy within STEM higher education and underscores the importance of comprehending empathy in academic settings [2][3].

In higher education, the cultivation of ethics and empathy stands as a cornerstone for nurturing a compassionate and supportive university culture. As we navigate the complexities of STEM higher education, the relationship between ethics and empathy emerges as a focal point of inquiry. Further, the COVID-19 pandemic has presented unprecedented challenges, magnifying the importance of understanding empathy within the academic realm [4]. The major project from which this work-in-progress stands from, was centered on exploring the culture of STEM ethics, with research questions specifically aimed at understanding what constitutes a culture of ethics. However, during the research, participants frequently discussed ethics and empathy interchangeably, leading to unexpected but significant insights. In this paper, we present these emerging themes related to empathy and explore the relationship between ethics and empathy, highlighting the nuances that emerged during our preliminary analysis.

By exploring the intersections of empathy and ethics, we aim to understand how empathy shapes the academic experience for both faculty and students within the university setting. We aim to achieve two objectives: 1) Exploring the emergence of empathy in university culture; 2) Analyzing the connection between ethics and empathy through faculty and student perspectives.

Methodologically, the primary study adopted a qualitative approach with focus group discussions serving as the primary conduit for data collection. These discussions, conducted at the end of two semesters within the academic year, encompass a diverse range of participants, including faculty members and students from various disciplines within the STEM domain. Through demographic information, such as gender, academic discipline, and level of experience, we aimed to capture a comprehensive spectrum of perspectives, enriching the depth and breadth of our analysis. In navigating this work-in-progress study, we aim to unravel the multifaceted dimensions of empathy within the university culture, recognizing its pivotal role in shaping a more inclusive, ethical, and resilient academic community.

II. ETHICS AND EMPATHY

A. *Why study ethical culture in higher education?*

The importance of studying ethics in any arena only continues to increase as constantly competing forces dwell in today's world. We find it especially critical to study ethical culture in the higher education setting [5] since it is within this arena that individuals are being prepared to make their contributions to the world in the future. Below, we share several premises that highlight why it is crucial to study what constitutes a culture of ethics in university, including some premises which evolved during our primary study on cultivating ethics STEM culture:

1. The health of the ethical culture reflects the overall health of the university's living and working environment.
2. The ethical culture of a university influences the teaching, research, and learning processes at a university.
3. Working in a positive ethical culture can have a positive impact on the well-being and satisfaction of employees at a university.
4. Students carry with them the influence of the ethical culture of the university when they graduate and enter their chosen professions.
5. The ethics of a graduate can determine their level of success as they navigate their chosen profession.
6. The ethical behavior of our graduates influences the companies and organizations they become associated with.

B. *The intersection of ethics and empathy*

The intersection of ethics and empathy within higher education represents a crucial nexus where principles of moral conduct intertwine with the capacity for understanding and resonating with the experiences of others. Ethics serve as the guiding framework for decision-making, emphasizing the importance of moral responsibility, integrity, and accountability in scientific inquiry and technological innovation [6]. Conversely, empathy, the ability to comprehend and share the feelings of others, fosters a deeper connection and consideration for the well-being and perspectives of individuals within the academic community and beyond [7].

In the context of STEM education, the integration of ethics and empathy is imperative for nurturing well-rounded professionals who not only possess technical proficiency but also demonstrate ethical awareness and interpersonal sensitivity [8]. By instilling ethical principles, students are equipped to navigate complex ethical dilemmas inherent in their field, ensuring that scientific advancements are pursued with integrity and societal benefit in mind [9]. Simultaneously, cultivating empathy fosters a culture of inclusivity, collaboration, and mutual respect, essential for fostering interdisciplinary teamwork and addressing the diverse needs of a global society [10].

In our primary study focused on understanding what constitutes culture of ethics within the university, intriguingly, discussions around empathy surfaced organically, despite the explicit focus on ethical principles. Participants consistently emphasized the importance of empathy in fostering a supportive and inclusive academic environment, underscoring its intrinsic connection to ethical conduct. This convergence highlights the symbiotic relationship between ethics and empathy, suggesting that an integrated approach to ethical education must encompass both domains to truly cultivate ethical leaders and responsible citizens within the STEM community and beyond.

Building upon the convergence between ethics and empathy, we recognized the significance of delving deeper into the supplementary finding regarding empathy within the context of our major study on the culture of ethics in STEM higher education. This convergence led us to explore the construct of empathy as an integral component of ethical education within STEM disciplines. To achieve this aim, we present the methodology employed, outlining our approach to investigating the emergence and significance of empathy within university culture amidst ethical education.

III. STUDY METHODOLOGY

The qualitative focus group methodology was utilized for this portion of our primary research in order to capture the perceptions of university faculty and students about their experiences teaching, pursuing research, and learning within the ethical culture at the university. The focus groups conducted with faculty were led by two researchers from the research team. The student focus groups were led by graduate student members of the research team. An identical set of interview questions developed by the research team was administered to each of the focus groups.

A. *Study settings*

The focus groups were conducted via Zoom and recorded. Four focus groups with students (two with first year engineering students, and two with senior Capstone design students), and nine focus groups with faculty members provided a rich set of perspectives, allowing for a comprehensive exploration of ethics within university culture.

Each focus group consisted of four participants and lasted approximately 75 minutes. All participants signed a consent form prior to the discussions. The researchers conducting the interviews ensured that equal time was allocated to each participant for answering the interview questions. Member-checking was implemented to verify the accuracy of the data, which was then anonymized before proceeding with the analysis.

Data analysis employing thematic analysis techniques, with focus on identifying patterns and themes related to ethics, is currently undergoing. For this work-in-progress paper, we explored emerging themes related to empathy and its intersections with ethics.

B. Analysis

In the initial coding process, our approach diverged from using a predefined theoretical framework or established coding rubric. Instead, we adopted an exploratory stance, allowing for the emergence of themes organically from the data. By anchoring our analysis around positive character traits (such as integrity and honesty, we aimed to uncover nuanced insights into the intersections of empathy, ethics, and positive character within the context of our study. This exploratory approach facilitated a flexible and open-ended exploration of the data, enabling us to capture the richness and complexity of participants' perspectives without imposing preconceived categories or biases. As a result, our analysis prioritized the identification of general emerging themes, patterns, and connections across the focus group transcripts, providing a holistic understanding of the phenomena under investigation.

We acknowledge that we have not yet conducted inter-rater reliability, as only one researcher has reviewed the transcripts multiple times and identified the emerging themes using the positive character framework. Additional work is needed to finalize these emerging themes related to empathy and to connect them more clearly to ethics. We anticipate offering a more refined analysis during the presentation.

IV. EMERGING THEMES

Our work-in-progress preliminary findings offer insights on the role empathy plays within ethical cultures and as part of individual behavior. The data revealed a host of positive character traits [11][12] used by participants to describe and define what an ethical culture means to them. The combination of all these traits which have a positive tendency, collectively describes empathic behavior. It seems if all these positive traits were present within a certain ethical culture, this would describe an almost utopia-like environment in which to live, work, and learn. Throughout initial coding we identified fourteen themes. We offer below a description of each theme and its relation to empathy and positive character.

1. *Understanding*: Empathy involves understanding others' perspectives, emotions, and experiences. This requires

active engagement and a willingness to see the world from different viewpoints, demonstrating openness and cognitive empathy.

2. *Listening*: Effective listening is a fundamental aspect of empathy, reflecting a genuine interest in others' thoughts and feelings. It demonstrates respect, attentiveness, and a willingness to validate others' experiences.

3. *Respect*: Empathy inherently entails respect for others' dignity, autonomy, and worth. Respectful engagement acknowledges the inherent value of each individual and fosters mutual understanding and cooperation.

4. *Honesty*: Authentic empathy necessitates honesty and sincerity in one's interactions. Being truthful and transparent builds trust and credibility, facilitating genuine connections and meaningful relationships.

5. *Inclusive*: Empathy promotes inclusivity by recognizing and embracing the diversity of human experiences and identities. Inclusive empathy fosters a sense of belonging and acceptance, transcending barriers of prejudice and discrimination.

6. *At peace*: Empathetic understanding can bring a sense of peace and tranquility, both internally and within relationships. It encourages emotional regulation and conflict resolution, fostering harmony and mutual support.

7. *Accepting differences*: Embracing diversity and accepting differences are integral aspects of empathy. By acknowledging and respecting the uniqueness of individuals, empathy promotes tolerance, empathy, and appreciation for diverse perspectives.

8. *Common good*: Empathy extends beyond individual interests to consider the collective welfare and common good. Altruistic empathy motivates individuals to act in ways that benefit others and contribute to the greater good of society.

9. *Appreciation*: Empathy involves appreciating and valuing others' experiences, strengths, and contributions. Expressing gratitude and recognition fosters positive relationships and strengthens social bonds.

10. *Goodness*: Empathy is inherently linked to goodness, reflecting a desire to alleviate suffering and promote wellbeing. Acts of kindness, generosity, and empathy exemplify the inherent goodness of human nature.

11. *Wellness*: Empathy contributes to emotional and psychological wellness by fostering connections, reducing isolation, and providing emotional support. It promotes mental health and resilience by validating emotions and facilitating coping strategies.

12. *Rightness, justice, and virtue*: Empathy aligns with principles of justice, fairness, and moral virtue. Ethical empathy motivates individuals to uphold principles of equity, fairness, and social justice, advocating for the rights and well-being of all.

13. *Integrity*: Empathetic individuals demonstrate integrity by aligning their words and actions with their empathetic values. Consistency, honesty, and ethical conduct are hallmarks of empathetic integrity.

14. *Harmlessness*: Empathy encompasses a commitment to do no harm and minimize suffering. It involves sensitivity to

others' vulnerabilities and a conscientious effort to avoid causing harm through words or actions.

The themes of empathy and positive character traits are deeply intertwined with ethics, forming the foundation of moral decision-making, ethical conduct, and virtuous behavior. Understanding, listening, and respect are fundamental ethical virtues that underpin empathetic engagement and ethical relationships. Ethical decision-making necessitates understanding others' perspectives, actively listening to diverse viewpoints, and treating individuals with respect and dignity, regardless of differences. By cultivating empathy and positive character traits, individuals develop the moral sensitivity and relational skills needed to navigate complex ethical dilemmas, promote justice, and foster inclusive, compassionate communities.

Honesty, inclusivity, and a commitment to the common good are essential ethical principles that align closely with empathy and positive character traits. Ethical integrity requires honesty, transparency, and truthfulness in all interactions, reflecting a commitment to ethical values and moral accountability. Inclusivity promotes fairness, equity, and justice by considering the needs and interests of all stakeholders, fostering empathy, and addressing systemic inequalities. Similarly, prioritizing the common good over individual interests or preferences reflects a commitment to ethical altruism, social responsibility, and the well-being of society. By integrating empathy and positive character traits into ethical decision-making and behavior, individuals can contribute to the cultivation of ethical cultures, promote human flourishing, and advance the principles of justice, compassion, and virtue in their communities and beyond.

V. LIMITATIONS AND NEXT STEPS

Our study is still a work-in-progress, and it does not yet yield significant results for broader conclusions. There are inherent limitations in our approach and the potential findings. One such limitation is that the study captures only a snapshot in time, specifically during a period heavily influenced by the COVID-19 pandemic. This temporal context may have skewed the results, and therefore, the findings might not fully represent long-term trends or behaviors in empathy and ethics. Further research is needed to assess how these dynamics evolve over time and across different contexts.

In addition to the limitations mentioned above, relying solely on focus groups may restrict the comprehensiveness of this work-in-progress. At this stage, we have identified 14 emerging themes across both groups, faculty and students, without yet distinguishing between their responses. Our preliminary findings are based on initial listening to the recordings and reading of the transcripts, which we have organized into themes such as challenges and opportunities in fostering empathy and the integration of empathy in academic disciplines (for faculty), as well as experiences and expectations of empathy in university life and the influence of COVID-19 on empathic behaviors (for students). Further

analysis is required to confirm and clarify these differences before reporting on any perspectives of the two groups.

Furthermore, both authors are strong advocates for the integration of empathy and ethics education in STEM, which may introduce bias into the interpretation of the results. This commitment to these values could influence how the findings are analyzed and presented, potentially shaping the themes and conclusions drawn from the data. In future work, we will take steps to minimize this bias by incorporating additional perspectives, using a more diverse team of researchers, and applying qualitative norms and techniques such as triangulation and peer debriefing to ensure a balanced and rigorous analysis of the data.

The next step in our research process involves refining the themes by creating a comprehensive coding rubric. This rubric will serve as a structured framework for systematically categorizing and analyzing the data, allowing for greater consistency and rigor in our analysis. Once the coding rubric is established, our focus will shift towards developing a theoretical framework that elucidates the nexus of empathy and ethics within the context of our study. Through the iterative process of refining themes, creating a coding rubric, and developing a theoretical framework, we aim to deepen our understanding of the intricate connections between empathy and ethics in the academic context.

By systematically analyzing the data and grounding our analysis within theoretical frameworks, we seek to generate nuanced insights that contribute to the advancement of knowledge and inform practical interventions aimed at fostering a more empathic and ethically aware university culture. Furthermore, our analysis will include an examination of potential differences in perceptions and experiences of empathy and ethics between faculty and students within the university community. By exploring these potential variations, we aim to elucidate how diverse roles, perspectives, and experiences may shape individuals' understandings and practices of empathy and ethical conduct within the academic culture.

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