

**mt Exploring Tensions of Using Interpretative Phenomenological Analysis in a Domain
with Conflicting Cultural Practices**

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Abstract: The philosophical foundations of interpretative phenomenological analysis ([IPA]; phenomenology, hermeneutics, and idiography) guide its practice and use. However, this foundation is often at odds with cultural practices of disciplines that value post-positivist perspectives that emphasize reality can be objectively known. The conflict between the philosophical underpinnings of the methodology and the cultural practices of particular disciplines can serve to limit the use and acceptance of IPA. This paper highlights ways that researchers can utilize IPA even when the underlying tenets of that methodological approach may be in conflict with disciplinary norms. As such, we have set out to explore the fruitful tensions that accompany the choice to use IPA in the context of engineering education research within the United States. As a group of engineering education researchers, we drew on collaborative inquiry to systematically examine our use of

IPA. Our exploration of using IPA, as connected to everyday practice in a discipline that takes a post-positivist stance towards knowledge generation provides examples for the use of IPA in tension with these disciplinary norms.

Keywords: *Interpretative Phenomenological Analysis; Collaborative Inquiry; Engineering Education*

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1. Introduction

Methodologies are inherently influenced and shaped by their use in disciplinary cultures (Hartas 2010). Methodologies with particular traditions and philosophical underpinnings from their original disciplinary roots that are used in a different disciplinary context may be in conflict with the particular epistemologies and axiologies of that other discipline. Where different disciplines interface, a series of tensions may arise between the norms, expectations, and practices of each discipline (Oborn & Dawson 2010). Cheville and Heywood (2016) discuss the nature of tension and its implications,

The definition [of tension] includes elements of balanced but opposing forces, latent hostility, and being stretched between fixed points

Tensions are by definition at least dipoles, and do not exist without at least two opposing and supported perspectives. Thus a tension is dialectical in nature and while not necessarily welcome, tension does not have purely negative connotations (p.4).

An inability to address tensions can yield negative consequences. In the field of engineering education in particular, the inability to address tensions might also contribute to a lack of progress related to educational innovation, limited inclusion of diverse individuals, and underdevelopment of engineering identities (Cheville & Heywood 2016). However, these

tensions can also provide useful outcomes in requiring researchers to reflectively traverse disciplinary boundaries and norms.

This work examines the experiences of five engineering education faculty who have spanned disciplinary boundaries and cultural norms to use interpretative phenomenological analysis (IPA) in their research. We used collaborative inquiry to elicit the tensions we have experienced in utilizing a method that is often in conflict with the dominant values of our discipline. This paper highlights ways that researchers can utilize IPA, even when the underlying tenets of that methodological approach may be in conflict with their disciplinary norms. While we speak to our experiences in engineering education research (EER); however, we posit that our experiences are not unique to the culture of engineering education, but are true of many disciplines or sub-disciplines that often take a post-positivist stance towards knowledge generation and provide transferable examples of the use of IPA in tension with disciplinary norms.

Engineering education researchers have leveraged qualitative methods from other disciplines to address the complexities associated with interest, engagement, learning, and attrition in engineering environments from K-12 education to the workplace (Major & Kirn 2016; Ross et al. 2017; Godwin & Potvin 2016; Huff et al. 2016; Kirn & Benson 2018; Huff et al. 2018).

While the original introduction of qualitative methods to the EER community was frequently met with resistance, the acceptance of many of these methodologies within the community has been achieved through wider uptake in research practice, reflective and thoughtful dialog, and

careful argumentation (Slaton & Pawley 2015; Walther et al. 2013). In recent years, the EER repertoire of qualitative methodologies has expanded to include IPA (Kirn & Benson 2018; Ross et al. 2017; Kirn et al. 2017; Miller et al. 2017; Perkins et al. 2017; Tsugawa-Nieves et al. 2017; Huff et al. 2014; Huff et al. 2018). Similar to the qualitative methods that preceded IPA in EER, this research approach has been met with resistance in parts of the EER community.

In particular, we, as IPA researchers, have experienced this resistance as tensions between attending to the needs of IPA and the norms and values of the EER community. Adam, James, and Monique have all acted as lead researchers in prior and present IPA studies. Allison and Cheryl are collaborators with the aforementioned authors on projects that explore aspects of engineering students' experiences. James has worked extensively with one of the originators of the method. Allison was Monique's doctoral dissertation advisor and James also served on her committee. Due to the small nature of this community within engineering education, the authors have served as reviewers of the methodology for the other authors both in formal and informal capacities. All authors conduct IPA in the U.S. The reflections of the authors' in this collaborative inquiry reflect the particular norms and practices in this particular context.

The goal of this paper is to provide an example of a discipline's cultural practices, specifically EER, that are at odds with a qualitative and interpretive methodology (i.e., IPA) by 1) defining what tensions arise from the application of IPA in EER and 2) discussing how we have navigated these tensions using collaborative inquiry as a guiding tool, and how these

tensions have proven fruitful in our work. By presenting a dialog about the tensions that have emerged when translating IPA across contexts, especially into disciplines with post-positivist approaches to knowledge generation, we can begin to understand the ways in which IPA has adapted and expanded its reach to understand lived experiences of individuals across disciplines. We also intended for this paper to serve as a guide for how researchers can systematically consider other disciplines outside of EER that may be in conflict with IPA and continue to move forward with high-impact research that preserves both the methodology and the cultural practices.

2. Underpinnings of the Tensions between IPA Foundations and EER Practices

2.1 Philosophical Foundations of IPA

IPA is rooted in the traditions of phenomenology, hermeneutics, and idiographic inquiry. In brief, IPA explores the subjective lived experiences of individuals through examination of individuals' first order (i.e., tangible lived experience) or second order experiences (i.e., socio-emotional reactions to lived experiences; (Merleau-Ponty 2002)). The explicit focus on accessing lived experience through interpretation is aligned with Heidegger's (2010) version of phenomenology and departs from the more descriptive form of phenomenology of Husserl (1982). In IPA studies the central focus of study is a "detailed examination of personal lived experience" of a certain phenomenon in individuals (Smith 2011a, p.9). In IPA, the investigator is intentionally walking with these individuals in a detailed examination of experience that is, in some regard, salient to both the investigator and individual research participants.

To access the lived experience of an individual and link this perspective to conceptual theories requires adopting a hermeneutic stance. As conceptualized by Gadamer (2013), hermeneutics provides language for IPA researchers to focus on how one can fuse the particular perspectives of the participant and researcher. In this process, the IPA researcher maximizes attention and openness to the lived experience of individuals but does not merely examine the individual on his or her own terms. Rather, the hermeneutic process is guided by engaging in a dynamic process of exploring the phenomenon as lived by individuals while also recognizing the broader significance of this phenomenon in relation to extant theory (Gadamer 2013; Smith et al. 2009). Indeed, engaging in this hermeneutic process involves a convicted form of openness by the researcher to allow prior concepts to be challenged by engaging in the lived experience of individuals on their own terms. As put by Smith et al. (2009), this mindset requires that the investigator approach individuals with neither an interpretation of trust nor suspicion, but by carefully walking alongside and questioning these experiences. Thus, informed by principles of hermeneutics, IPA is committed to doing justice to existing theoretical concepts by articulating and challenging them through the lived worlds of individuals.

In order to conduct a thorough examination of individuals, IPA requires a commitment to “the particular” or the idiographic (Smith et al. 2009, p.29). Idiographic commitments contrast with a nomothetic stance where the researcher is primarily concerned with making claims at the group or population level (e.g., Adler 2017; Robinson & McAdams 2015). As such,

knowledge claims of IPA studies are intended to provide contextual insight of particular phenomenon rather than speaking explicitly to the breadth of applicability of certain constructs. This idiographic commitment does not negate a concern for generalizability, but it does reframe how findings from a given IPA study might be considered as transferrable to other domains beyond the context of the investigation. The findings of IPA investigations are focused on providing deep insight as connected to extant theory, which facilitates the readers' capacity to re-envision how they might see the phenomenon in question.

These philosophical commitments, when taken together, create a layered approach to interpretation that utilizes existing knowledge (i.e., theory) to support the results presented in participants' voices. These commitments to phenomenology, hermeneutics, and idiographic investigation coalesce to guide the IPA investigator in advancing theoretical development by carefully examining individuals' lived experiences. A detailed discussion of the philosophical underpinnings of IPA and a comparison to other similar methods can be found in Smith, Flowers, and Larkin's (2009) book.

2.2 Cultural Practices of EER

Often in contrast with the philosophical foundations of IPA, the cultural practices of engineering shape and inform the practices of EER. Such practices have been defined as working with tangible, definable, measurable, quantifiable realities; promoting difficulty or challenge; being proud to be a member of the engineering community; and enacting a right way to interact with others (Godfrey & Parker 2010). These cultural values and priorities

drive the development of communities of practice, accreditation processes, and individual level priorities that directly impact engineering research (Cech & Sherick 2015; Faulkner 2000; Godfrey & Parker 2010). In this context, engineering often assumes a post-positive stance to knowledge that shapes how research is valued and which methodologies are used (Koro-Ljungberg & Douglas 2008), often devaluing of interpretive methodologies like IPA.

Additionally, engineering is perceived as an industry-driven field (i.e., practical solutions must be generated) that divides technical from social aspects. The socio-technical divide manifests in the valuing of technical skills (e.g., problem solving, differential equations) over professional skills (e.g., communication skills, interpersonal skills; (Cech & Sherick 2015; Godfrey & Parker 2010)). This divide, described as the depoliticization of engineering, manifests in educational environments that celebrate the removal of the social components that drive the need for engineers (Cech & Sherick 2015; Godfrey & Parker 2010). The prioritization of the technical over the social leads to the continued reconstruction of a culture rooted in a technical meritocracy (i.e., reward based on technical ability). This disconnect between technical engineering content and the people who are influenced by its implementation is in direct conflict with the hermeneutic stance and idiographic commitment of IPA.

Although the EER utilizes tools and methodologies from education, psychology, and other social science disciplines, the underlying culture is still shaped by the values and expectations of traditional engineering disciplines. EER is described as a discipline that often undercuts the

value of interpretive qualitative methodologies as not rigorous enough (Riley 2017).

However, engineering education researchers have begun to challenge these cultural practices, for example, through explicit consideration of qualitative studies with small numbers (Slaton & Pawley 2015; Pawley 2013) and training in the use of interpretive methodologies (Walther et al. 2013). Despite increasing acceptance of interpretive research approaches, generally speaking, the cultural values of engineering education have remained largely unchanged. As such, the culture of engineering in the United States influences the perceived utility of IPA for asking and answering research questions within EER. It is this tension that we explore through collaborative inquiry (Torbert 1981) by explicitly considering: “What are the areas of conflict, overlap, or consistency between the cultural practices of EER and the philosophical foundations of IPA?” In a more practical sense, the use of collaborative inquiry allowed the authors to construct a productive dialog to work through and with the tensions that arose when using IPA in EER.

3. Methods

We used collaborative inquiry to elicit shared experiences, reflect on those elicitations, and describe the collective tensions experienced in using IPA in EER. This exploration can provide transferrable examples of how IPA may be used in disciplinary cultures like EER that do not align with the philosophical foundations of IPA. Collaborative inquiry is both a tool and process to systematically inform practice and is typically used to build consensus and action on difficult topics (Torbert 1981). Participants of collaborative inquiry, simultaneously and repeatedly, serve as both researchers (i.e., those that gather information through reflection

on previous actions) and practitioners (i.e., those that base future action-oriented decisions on information gathered through reflections (Torbert 1981)). Collaborative inquiry involves real-time learning and discussion with other researchers to reflect on collective experiences and draw conclusions about how to adapt future practice. This research method has historically been used in education settings, whereby teachers could better inform their practice through a series of reflections and discussions intended to validate proposed iterations to their teaching methods. Collaborative inquiry has gained traction in studies seeking to inform a specified action or practice. Furthermore, it has been previously applied in EER to assess quality among a range of diverse qualitative methods (Walther et al. 2017) and to capture the development and negotiations of first-year faculty (Faber et al. 2016). Here, collaborative inquiry provided a guiding structure to not only inform our own practice of IPA in EER but also to formulate and address our guiding question for formal reflection in a systematic and deliberate manner.

We applied collaborative inquiry techniques in two ways. First, and in a more practical sense, we applied collaborative inquiry to examine how we used IPA methodology to guide reflective actions in our work. Over three years, we have met in-person and virtually to explore the use of IPA and the tensions that manifested from using IPA in an EER context. This process started out as an informal collaborative experience between colleagues. As a part of these conversations, we wrestled with the tensions that each of us has experienced in trying to propose, publish, and present IPA in EER. Second, in the past year, we formalized these discussions and explorations of the use of IPA within EER. In this more formal, documented

collaborative inquiry, we engaged in discussion, questioning, and exploration of our experiences through explicit considerations centered on how we work to ensure quality in IPA in light of tensions caused by our use of IPA in EER. As a part of this process, we documented the three meetings we had over the past year, one in-person and two virtually, through notes from the five authors.

We also collaboratively developed two sets of prompts to provide written reflections from the authors. The first set of prompts focused on the experience of using IPA in our research. The second focused on eliciting our positioning with respect to research and our backgrounds in conducting interpretive research. Both of these sets of reflection prompts were administered through Qualtrics two weeks apart. The first set of prompts included a total of six questions on which the authors reflected and provided written responses to capture each author's experiences with IPA in EER:

- “What do you feel is expected for high quality Engineering Education Research?”
- “What do you feel is expected in high quality interpretative phenomenological analysis (IPA)?”
- “Can you describe a time when you felt alignment in using IPA in Engineering Education Research?”
- “Can you describe a time when you felt tension in using IPA in Engineering Education Research?”
- “How did you navigate the tension?”
- “Are there any other thoughts you would like to share?”

The second set of prompts included seven questions on which the authors reflected and provided written responses to capture each author's own positionality and connections to IPA:

- “Please describe your positioning as a researcher. Some things to think about (gender identity, race/ethnicity, sexual orientation, disability status, parental level of education, nationality, background experiences) that might impact your way of approaching data collection, analysis, and interpretation.”
- “How do the identities you described interact together?”
- “What are your most salient identities in your work? In what contexts are your different identities salient and why? How does engineering fit with those identities? How stable are these identities in how you see yourself?”
- “How do you think about how research captures what is knowable and the approaches to understanding reality?”
- “What is the role of the researcher in qualitative data analysis?”
- “How would you describe your approach to IPA?”
- “Are there any other experiences that you think influence your conceptualization of research using IPA?”

After this process, we analyzed these reflections both individually and collaboratively utilizing a constant comparative coding method. Constant comparative analysis was used as it allowed for salient categories of meaning and relationships between categories to be derived from the data itself through a process of inductive reasoning (Lincoln & Guba 1985).

Responses to each of the questions articulated above were treated as a unit of analysis and initial categories and subthemes were generated for each question by each author. After analysis for common and unique experiences of using IPA in EER by the author team, we met virtually to discuss our individual and collective experiences. Through discussion of each author's analysis, we were able to refine each of our initial conceptualizations into themes that reflected our experiences as researchers and practitioners. This theme building centered around the challenges and opportunities faced in spanning the boundaries between cultural practices. In the rest of this paper, we describe our findings and provide specific examples of our own experiences that have the potential for significant influence on practice not only in EER but also in other disciplines that may have similar challenges. Therefore, the latter portions of this paper serve as the findings from our formal collaborative inquiry, and it is this generation of knowledge that will continue to guide iterations of IPA in EER and other tension-generating communities of practice.

4. Results

Our results highlighted particular shared experiences by the research team. In this section, we discuss the ways in which we have experienced tension within EER and IPA to advance methodological discussions about how IPA can be used by diverse disciplinary cultures. First, we outline our collective tensions as researchers in the overlapping boundaries of IPA and EER. Then, we expand our discussion to highlight the perceived tensions generated from applying IPA in our work. The results of this discussion are considerations for researchers

who may use IPA in disciplinary traditions not well-aligned with the traditions of this qualitative methodology.

4.1 Socialized norms in EER

As faculty in EER, we are adept in navigating the cultural norms of EER. Typically, these norms represent features of our disciplinary home that we individually enact without conscious thought. However, in the process of exploring the tension between EER cultural practices and upholding commitments of IPA, these norms became salient. For example, James described his perception of how EER tends to value studies that promise practical solutions to problems in education:

We connect to the grand narrative, the problems that are dramatic, and our studies are positioned as contributing to solutions to these poignant messy issues . . . We tend to value claims that translate to immediate actions in education—and for good reason. Many among us are employed by academic entities who do not fully appreciate our inquiry into the social situation of engineering. We are well-practiced in justifying our existence by connecting our research to educational practice.

Cheryl corroborated this experience, stating:

My conceptualization of research is certainly influenced by external organizations including funding sources and by those that control dissemination of work (journal editorial boards, reviewers, etc.) . . . In the culture of engineering education, I am driven by a need to seek an action for intervention on the student experience.

This common experience of feeling driven to solution-oriented results stems from research agendas that are described in national reports for EER. For example, Jamieson & Lohmann's (2009) report published by the American Society for Engineering Education states that "[EER] differs from general education research in that the emphasis is on student understanding of engineering rather than on educational theory or methodology in general" (p. 9). Further, many in EER see their practice as situated within discipline-based educational research (DBER), a term that encompasses the studies of educational phenomena "with deep grounding in the discipline's priorities, worldview, knowledge, and practices" (National Research Council et al. 2012 p. 9). Our positioning as DBER researchers often creates tension when we seek to bridge multiple communities of practice and bring methodologies not aligned with cultural practices of EER, such as IPA, into the community (Shell et al. 2015).

This view of EER as practical and outcomes-based can be at odds with other disciplines including education and educational psychology research that is focused on more theoretical knowledge claims. Thus, we find ourselves utilizing a research methodology, IPA, whose methods are defined by social science research within EER, a field where the culturally

acceptable ways of being are defined by a community that champions pragmatic solutions based on post-positivist evidence (Godfrey & Parker 2010; Faulkner 2000; Cech & Sherick 2015). Consequently, our work and we as researchers reside in the space of tension between those committed to IPA and those encultured in engineering.

4.2 Interlopers in IPA

Against the backdrop of our common experience of socialization in the norms of EER, we noted, in most cases, a weaker socialization in the IPA community. Several of us began our investment in IPA research as individuals that were connected to texts that described the methodology (e.g., Smith et al. 2009) and through relationships with various members of the author team. Thus, in contrast to the robust community of EER that defined our growth as academic researchers, we began our investment in IPA with a sparse community. Allison gave voice to an experience that was shared among the author team:

I feel tension with the debates over terminology and approaches (and whether or not they align with the underlying philosophical underpinnings of IPA) . . . I feel a tension of being an interloper in the world of IPA and IPA researchers who have almost exclusively embraced a particular methodology as their approach to understanding the world. Not being as invested, the debates and discussions about IPA as a methodology seem to distract from the purpose of research and make me question if I should be using IPA, at all, if I am not a “real” IPA researcher.

Like Allison, much of the author team identified with her sentiment of using IPA as a tool for answering research questions versus embodying IPA as a particular way of viewing one's world of inquiry. Consequently, when confronted with expectations of IPA, via text, online forums, or informal discussions, several among us felt challenged with regard to our identities as IPA researchers.

Even James, who does identify primarily as an IPA researcher and was trained by one of the founding members of the method, noted how his everyday expectations of his career in an engineering context did not acknowledge his role as an IPA researcher. Despite his activity in conducting and fostering development of IPA research, he described how the EER community was more salient to his professional expectations:

While strongly identifying as an IPA researcher, I am not surrounded by a consistent discourse about IPA. Nor do I need to navigate social pressures of the IPA community in order to have a vibrant research career, whereas I feel that I do in EER.

We note in his statement that his participation in EER did not undermine his capacity to conduct IPA research. Rather, while occupying dual roles in EER and IPA, he recognized that he felt more accountability in the role of being a researcher and educator within engineering programs. Regardless of our position or past experience with IPA, the author team collectively agreed that there was little community discourse around IPA when compared to the discourse

concerning career expectations within EER. In addition to confronting our feelings of being interlopers in IPA research, the author team recognized that our professional trajectories placed us in contexts where we felt salient identities as members of the EER community but much less so with the IPA community.

Upon group reflection and discussion, these tensions between our identities as EER researchers with a vibrant community and feeling like outsiders in IPA circles created a context in which our research felt like it had to be overly explained or defended. This defense of our work occurred in both engineering education and IPA circles. Our choice of methodology made us feel like boundary crossers in the borderlands of cultural practices that did not align in values or ideology.

4.3 Living in the tension between EER and IPA mindsets

Through our shared exploration of applying IPA in EER, we found that we experienced tension in two distinct ways. First, we felt external pressures against using IPA, particularly from grant review panels and journal reviewers that evaluate the quality of our work. Second, some of us have pushed against the commitments of IPA as we live out the method in our own investigations.

We particularly noticed external expectations in communicating IPA within EER. Two examples that consistently came forward as a tension point for the entire group were crafting research proposals for funding or working to publish results in EER journals. In the United

States, grant proposals are typically subject to a review that focuses on the intellectual merit and broader impact of the proposed work. For reasons already discussed, EER is funded to provide transformative approaches to education. As identified by Adam:

[I have experienced tension with IPA] during attempts to publish and when submitting grants. . . There is often a need in [EER] for large n [sample size] and concerns about a lack of [statistical] power and generalizability in small n . While, these are only the voices of a few, they are often the loudest. EER expects results to be presented with efficiency which does not mesh well with the need to protect the voice of the participant in IPA research. In fact, reviewers, in both journals and grant panels, often expect researchers to distill down their results into neat themes rather than allowing for the messiness and complexity of IPA.

Adam identified a core dilemma that was experienced throughout the author team. Cheryl also discussed how, in her institutional context, this particular dilemma was enhanced when being evaluated by engineering academic colleagues who thought of EER as involving “student anecdotes and suggestions from practitioners.” She elaborated on how this necessitated her to cast her work as “adherence to the scientific method” to gain acceptance by these peers. Her experience highlights how the cultural expectations of research within EER, in part, are a reaction to perceptions of social research in engineering more broadly.

Thus, confronted with evaluation from others who are not familiar with the demands of IPA, we are left questioning if this culturally mediated evaluation affords the opportunity to implement robust IPA research and how this methodology manifests in the domain of EER and other disciplines with post-positivist stances towards knowledge generation. Do we satisfy reviewers by allowing larger numbers of participants at the cost of idiographic analysis? Do we reduce the complexity of individual analysis to conform to the collective norm of presenting knowledge claims succinctly? How do we cultivate a practice of IPA research in the contexts of our research groups?

We also note how research in EER is highly collaborative and often implemented in teams. Allison and Monique each highlighted the difficulty that they experienced in conducting IPA research in the context of a collaborative team. As put by Allison:

The tension in IPA for me arises from a practical standpoint. It is common in EER to have a collaborative team analyzing data . . . The positioning of a team of researchers is much more difficult than examining the position of one analyst and his/her influence on the results.

The tension that Allison highlights is readily understood by the author team. In our respective experiences in research, we have each contributed to qualitative research projects that were collectively analyzed by a research team, often employing a codebook or deductive method (see Kirn et al. 2017 for details). The results of these projects were socially constructed in a

research team. Our individual journeys into IPA research have challenged each of us to gain deeper awareness of individual positioning as the interpreter of the data. However, each of us struggle with how collaboration can most effectively occur in IPA projects.

Although we experience external expectations from the EER community that challenge our use of IPA, we also intentionally live in tension as we practice the method. Attending to the idiosyncratic detail of individual experience works against the practical commitment to expectations of generating multiple publications, which are common for faculty in the United States. As put by Monique:

I find the entire process is fraught with tension, in spite of my adherence to the more traditional use of the method. This desire to adhere to the idiosyncratic while compressing the experiences of many to a few themes, seems in and of itself to be a tension. I think this is why publishing work from an IPA is such a challenge. How do you do both in 40 pages [as in a journal manuscript]? I appreciated the duality of the method but still find that it is in conflict even in its purest form.

Monique's perspective resonates with the tension imbued in researchers enacting the hermeneutic circle in the interpretive processes of IPA. On one extreme, we are diving to the depths of embodied lived experience for individuals, and on another extreme, we are communicating knowledge claims that coherently and concisely capture these phenomena. As

we discuss in the next section, living in this space of tension is critical for sharpening ourselves as both engineering education researchers and practitioners of IPA.

4.4 Moving forward in the fruitful tension

As we have described, we collectively identify tensions that characterizes our existence as IPA researchers in EER. However, we find the fruit of this tension as we carry out inquiries within our context of EER. In some ways, it seems as though we are neither fully accepted EER or IPA experts as we navigate the boundary spaces between a disciplinary culture and methodological commitments that are not epistemologically or axiologically aligned. To identify fully as an IPA researcher threatens to undermine our credibility within EER by working against dominant values regarding research. And, to wholly embrace the norms of EER pushes us to ways of knowing that seek clean resolution of knowledge claims that are driven by impact of educational practice, mitigating our capacity to fully practice IPA.

But, we move forward to reflect on our position in this situation. Are we entities to be stretched by competing demands? Or, do we author our own paths in this in-between space? We choose to move forward as agents of our own inquiries. Some of us navigate this agency by stretching what feels acceptable within IPA to carry out qualitative research in engineering education. As reflected by Allison:

In the studies in which I have used IPA, I have modified the approach to suit the research question, theoretical framework, and data collected. I seek to be

true to the fundamental principles of acknowledging that data are co-constructed by the researcher and the participant and the rich passes of interpretation taken with the data. However, I also move past some of the traditions of small sample sizes and individual work.

Allison's reflection captures a sentiment that was felt among several in the author team. There was a shared feeling of violating or "breaking" IPA when making choices to deviate from the recommended practices of using small samples sizes or having an individual carry out the data analysis. Adam expressed how he aligned with this statement, noting:

I have pushed my numbers in my studies to their limits. At times proposing upwards of 25 students for an IPA. This has afforded me funding. When publishing I have sacrificed individual voices or elements of IPA to navigate the publishing process. I have had to move work in a more thematic direction. In many ways these shifts have moved me away from the purest methodological implementation of IPA to using IPA to guide my approaches to qualitative data analysis and presentation.

Adam's final acknowledgement that his work heads "in a more thematic direction" reframes the decisions made in this middle space. Rather than thinking about our changes as compromises to the methodology we are working to shift the EER's cultural practices toward qualitative research. Living as researchers between IPA and EER helps us see where the

norms of our culture stretch our use of research methods, but it also helps us to stretch the norms of engineering culture. While some work in the author team has not adhered to IPA in the purest sense (nor has it claimed to), through IPA, we are probing underexplored phenomena that constitute the “secret gems” of engineering education (Smith 2011b).

While this fruitful tension was characterized by IPA stretching the research norms of EER, other members of the author team, who identified primarily as IPA researchers, have experienced the benefits of tension by implementing this method in the context of engineering education. In particular, the socialization of EER norms allowed all of the author team to create infrastructure (e.g., facilities, funding, professional development opportunity) to exist as social researchers while being employed as engineering educators. As stated by James:

Even though I am not surrounded by critical skeptics of my work at my institution, it is readily accessible to me how I justify the existence my research. . . I think the fact that EER norms challenge me to think of the ‘so what?’ of my research—it forces me to be grounded in my research to investigations that connect to people where they are.

For James and Monique in particular, the tension of living in the boundary space of IPA and EER produced fruit of a different nature than previously discussed. While they aligned with all of the author team in a shared experience of pushing on the norms of EER, they have found that the expectation to articulate the transformative nature of their research has caused them to

focus their work on personal lived experience that is relevant to engineering education stakeholders. Consequently, this has enabled them to critically examine when personal experience is salient to the EER community. Thus, the IPA research is bolstered by focusing on lived experiences that are significant to research participants rather than focusing on constructs that exclusively reside in a theoretical space.

We also note that we do not live in this tension in a binary—where some are primarily EER researchers that are stretched by IPA while others are not. We all find ourselves in the fruitful tension of the boundary space between IPA and EER, feeling and contributing to the tension that we experience. But the experience of this tension is productive, and we move forward by living through it rather than rushing to resolve it.

5. Discussion

5.1 Transferability of Experiences in EER to Other Disciplines

While we have reflected on our experiences of utilizing IPA in the cultural traditions of EER, we recognize that these experiences share many parallels with other social science disciplines, including but not limited to psychology. As we seek to connect the ideas of this work to the intersection of other domains, we do not claim that our experiences are generalizable, but rather that our experiences have elements of transferability to other domains. When we reflect on the practices of many research psychologists, we recognize that there is a prioritization of quantitative, experimental, and reproducible work. IPA does not align with these traditions, but rather provides a different lens for exploring human development, achievement processes,

and action. Therefore, the concerns of socialization in other traditions, interloping on another domain, and living in tension are not unique to us as researchers in EER.

As the tensions that we reported are not unique to one particular discipline, we have provided this paper as a transparent dialogue that acknowledges these tensions exist. Through presentation of this transparent dialogue we have served to bring attention to the IPA and psychology communities of the issues that may hinder the uptake of IPA as a methodology. Additionally, we have brought this conversation forward, not as a warning to those seeking to utilize IPA, but as a grounds for encouraging its use of the methodology in interdisciplinary contexts with conflicting cultural practices. In EER, IPA has allowed us to richly explore the lived experiences of engineering students, in ways not previously documented in the literature, and develop innovative ways of teaching, fostering, and mentoring students. As the growth of IPA continues, it will continue to intersect with other cultural practices and will continue to cause tension. Without conversations, such as those presented in this work, the misunderstandings that result from unaddressed tensions can yield negative consequences (e.g., a lack of progress related to methodological innovation (Cheville & Heywood 2016)).

5.2 Benefits of Conducting Collaborative Inquiry

The process of conducting a collaborative inquiry served to guide the development of the author team as both methodologists who utilize IPA and more broadly as researchers who span across the boundaries of disciplines and cultural practices. Specifically, using collaborative inquiry allowed the author team to formalize our problems, concerns, and

challenges when implementing IPA. The process formalizing these issues in a small community of researchers and the reflection of describing our tensions for a broader audience refined our understanding of what the tensions in our IPA research in EER actually were. Through the co-construction of a group dialogue we were able to address the problems we encountered when implementing IPA in EER to better present the participant voice. While this collaborative inquiry approach allowed us to solve problems, it also helped to generate and sustain a community of researchers, who may otherwise have been remained in individual, often lonely, tension. The establishment of this small community of practice served to create formal mechanisms to recognize the challenges we faced, promote the interests we have, and gave us a space to perform as IPA researchers where we could refine our arguments and presentations to the EER community. Based on these benefits, we encourage others seeking to enhance the implementation of IPA or seeking to create innovation that conflicts with cultural practices to engage in collaborative inquiry. There exists a broad range of resources for successfully implementing collaborative inquiry as part of one's work, as a starting point we suggest the following references (Faber et al. 2016; Torbert 1981; Walther et al. 2017).

5. Conclusions

In this work, we have been transparent about tensions experienced with IPA in EER. These tensions came from ongoing conversations among the authors about the value of using IPA and also through the challenge of applying this methodology in our own research. We want to be careful to represent these experiences as our own and not generalize to “how this is” for all

researchers across multiple communities. We are describing ourselves as multidimensional researchers that stand in contrast to engineering education researchers who do not embrace interpretive research methodologies. Our intention was to discuss the felt tensions that we experienced as boundary crossers between research paradigms with different cultural values. In this collaborative inquiry, we described how we have navigated the pressures of our perceived norms of EER and IPA to better understand our own work as well as provide a dialog for other researchers in the borderlands of IPA and their disciplinary norms who may experience these tensions as well.

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