Evaluating the quality of interviews with a process-based, self-reflective tool

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Abstract

This methods paper presents the *interview quality reflection tool* (IQRT) to evaluate the quality of qualitative research interviews. Qualitative researchers commonly use semi-structured interviews that rely on the interviewers' ability to improvise in real time based upon the needs of the study. Given that interviewing involves numerous tacit skills that cannot be delineated by a simple written protocol, it is necessary that researchers develop interview competencies through practice and reflection. While prior literature on interviewing has often focused on developing interview protocols, we know little about how interviewers themselves may be trained to gather high-quality data. In this paper, we focus on how the IQRT may be used to guide the self-assessment of research interviews. We discuss how interviews are used in engineering education, how we developed and applied the IQRT, and how lessons learned through using this tool might lead to improved interviewing skills through careful examination of interview structure, content, and context within the mentoring process.

Introduction

Conducting high-quality interviews is perhaps one of the most crucial skills in a qualitative researcher's toolkit. Yet, when we read the methodology sections of numerous qualitative studies, we find little to aid researchers in honing the skill of interviewing. Buried sometimes in lengthy descriptions of interview protocols and analytic methods, we typically find a single sentence stating that the researchers interviewed a certain number of students. Qualitative researchers of every experience level know that such a sentence is the tip of an iceberg. If interviews do not accomplish the goals of the study, researchers are left with hundreds of hours of data to analyze that may not be useful for accomplishing the goals of their investigation. In engineering education research (EER), and in social science research more broadly, we need systematic processes to train interviewers as people who can create a robust environment for data collection. We need techniques to hone their presence as interviewers rather than sharpening their protocols.

Although interviews are generally guided by a protocol and pre-established goals, the nature of semi- and unstructured interviewing means there is a heavy reliance on the interviewer's ability to improvise their presentation of questions in reaction to an interviewee's responses in real time. This need for intuitive adaptability by the interviewer lends less structured interviewing approaches the reputation of required skills that must be learned, practiced, and developed over time. Beyond preparing an interview protocol, interview-based researchers need to manage complex dynamics experienced during the course of interviews such as timing and rhythm, sensitivity and empathy, navigating the ethics and utility of probing questions, managing emotional reactions that interview participant responses can conjure, or recalling details to return to later in the interview [1]. In short, there are several factors that lead to effective interviewing,

but lacking clarity of how to evaluate doing so, which ultimately would greatly enhance the quality of research in every stage of development.

Numerous studies in the EER discipline use interviewing as a form of data collection across a broad range of topics and diverse applications, demonstrating its prominence and utility in the field. Further, many engineering faculty conduct EER or join the EER community with limited experience in conducting social or educational research, showcasing the need for training in fundamental skills like interviewing. There are several combinations of modalities, structures, and methodological frameworks available for conducting research interviews, highlighting the importance of careful evaluation and skill development among new and established researchers alike. While there is an abundance of literature and resources on designing interview protocols for research, there is limited empirical or theoretical literature available that focuses on teaching and developing research interview skills. What resources do exist are mostly concentrated in clinical or applied research disciplines such as healthcare [2], social work [3], and human resource management [4], and these are often patient- or candidate-facing interviews which focus on evaluative goals rather than experiential.

In many ways, developing interview skills emerges from the acts of reviewing, observing, and practicing them. Roulston [5] describes several strategies for developing interviewing skills including interview preparation activities such as theorizing the researcher prior to and during a study, examining other researchers' interview practices, and designing a self-led interview project, as well as applied activities like practicing conducting interviews, working with interview data, and developing a reflective interview practice. Novice interviewers can develop mastery of technical aspects of conducting interviews like equipment needed as well as explaining the research to interview participants, obtaining consent, and developing conversational skills that elicit descriptive response. In contrast, complex skills like managing timing, navigating interactions with interview participants and unexpected behaviors or episodes, conversational skills, and generating interview questions 'on the fly', require hands-on practice and reflection. Several studies highlight the benefits of reflexivity in developing interview skills through mentored supervision [6], reviewing videorecorded interviews [7], role-playing with trained interview participants or student colleagues [8, 9], or through conducting interviews followed by reflective journaling and critique [10].

While the processes of developing protocols are often discussed in extant methodological literature (see for example [11-13]) we know of no consistent approach for systematically examining the quality of emergent features of interviews. To address this gap, this paper aims to 1) demystify the manner of asking emerging questions during a qualitative interview and 2) propose a consistent process-based tool, the *interview quality reflection tool* (IQRT) for evaluating the quality of interviews while orienting the interviewer to examine their presence in the interview. We introduce the IQRT as informed by the characteristic modalities, structures, and purposes of interviews created to assess and reflect on quality of questions that are asked in the context of semi- or unstructured interviews. We introduce the IQRT in the context of interview-based research in engineering education, which we overview in the following section.

Interviewing in engineering education research

There are several characteristics of research interviews including modality, structure, and purpose (or what Mann [14] refers to as 'type'). These characteristics must be considered in the context of the research design including epistemologies and theoretical perspectives, research questions and objectives, study sample size as well as logistic needs considering researcher and participant locations, mobility, and accessibility. Here, we describe some of the fundamental characteristics of interviews and provide examples of them in the context of EER to inform research decisions, interview design, and aspects of assessment for building interview skills.

Interview modality

Research interviews are typically conducted in either synchronous or asynchronous modalities. Synchronous interviews are typically scheduled interactions with participants that occur in real-time meetings that held face-to-face [15], by telephone [16], or virtually through audio/video [17] or messenger software [18]. In contrast, asynchronous research interviews are not affected by scheduling limits as participants can complete the interviews in their own time, for example, via email [19] or audio/video recordings [20]. Many studies in EER that use interviewing for data collection employ synchronous modalities, primarily via in-person or virtually. For example, Lucas and Hanson [21] used telephone interviews as part of a mixed methods study examining engineering habits of mind among engineering faculty throughout the United Kingdom. Face-to-face interviews have been the 'gold standard' of interviewing, however, recent evidence suggests that asynchronous options may provide more robust and authentic data collection by allowing greater flexibility and reducing the presence of the researcher [15]. For example, Yasmin [22] used email interviews as part of a mixed method study examining impacts on chemical engineering students' motivation and interest on online learning platforms, however, it was not clear how the modality did or did not influence data collection and the results.

One additional modality consideration is whether interviews are held with individuals or focus groups, which can influence the environment as well as the disposition of both the interviewer and participants. Numerous EER studies make use of one-on-one interviews with individuals, which can be appropriate for probing personal narratives and experiences. For example, [23] conducted a single-participant, longitudinal study on the marginalized experience in engineering. Focus group interviews have been used widely as well in EER, particularly in examining interactive and cultural experiences in engineering. Other studies by Secules, et al. [24] and Walther, et al. [25] interviewed focus groups to examine social constructions of professional identity among engineering students. In the case we present here, we conducted a one-on-one, synchronous interview in a virtual setting. These modality characteristics likely played a role in creating a space for sharing personal experiences through a private and conversational interview. Though it was not face-to-face, the virtual modality allowed for flexibility and the ability to ensure privacy and comfort during the interview. Given the advantages and disadvantages to each modality [18], each approach lends itself to varying levels of structure depending on the needs of the study.

Interview structure

Broadly, interview structures fall into three categories: structured, semi-structured, or unstructured, all of which are common in educational research [26]. Structured interviews, which can be adapted to both synchronous and asynchronous interview modalities, involve asking participants a standardized set of questions, often in the same order. Semi-structured interviews similarly use a pre-determined interview protocol based on the phenomenon in question, however, it serves more as a guide rather than a strict script, resulting in deviations from the questions during the interview. Semi-structured interviewing has become the dominant structure of interviewing in EER, with numerous studies using the practice to gain deep understanding of participants' experiences across a variety of topics ranging from engineering student learning [27, 28], thriving [29, 30], and social capital [31] to faculty instructional approaches [32, 33] and engineering culture [34].

Unstructured interviews are unrestrained by a protocol, though there may be a checklist of key topics to address [14]. For example, in Huff et al 2021, an unstructured interview approach was used to examine student's lived experiences in engineering education. Though they were guided by overarching talking points and interview goals, they did not ask predetermined questions and adapted their questioning throughout the course of the interview based on the participants' responses. Given the unstandardized configuration of semi- and unstructured interviewing, interviewers rely heavily on their skills and experiences to manage the dynamics of the interview. In addition to the degree of structure in research interviews, the underlying nature of interviews can also include considering the advantages of using conversational vs. non-conversational language, informal vs. formal setting, and directive vs. non-directive questioning by the interviewer [14]. For example, Dringenberg and Purzer [28] purposefully utilized conversational and accessible language in their interviews with engineering students to explore how student teams worked through ill-structured engineering problems. In our development of the IQRT, we conducted an unstructured interview in which various interview questions were aligned with goals. For each goal, some questions were prepared prior to the interview not as a prescription but rather to serve as an example for potential paths of inquiry. In this way, the interview questions were scaffolded by the interview goals but otherwise unplanned. As such, the interviewer was forced to adapt questions throughout the interview, which provided an opportunity to practice interview skills she had been observing and practicing prior to actually conducting one for the project.

Interview purpose

Finally, there are several interview purposes, which are largely informed by qualitative research methodologies. Here, we provide some examples of common types of research interviews, though this list is not exhaustive. One common interview type is the cognitive interview which is used to elicit data on participants' responses and interpretations of specific stimuli or situations [14]. One recent work-in-progress study is using cognitive interviews to assess peer reviewing among EER mentored groups [35]. Related to the cognitive interview process is the think-aloud interview (TAI), which can be used to explore how participants make sense of concepts or work through problem-solving. For example, TAIs have recently been used to explore engineering

design process among 6-9th grade students [36] and to assess engineering students' practice of non-technical professional skills [37].

Other interview approaches focus on participants' experiences as a story. Ethnographic interviewing aims to draw understanding of participants' experiences in their natural setting and often is performed in conjunction with observational data collection. Several EER studies have employed ethnographic interviewing to examine topics such as the cultural landscape of engineering education [34], knowledge funds among first-generation college students in engineering [38], and how early career engineering faculty navigate transitioning from research-intensive institutions to teaching-focused institutions [39]. Life-story interviews similarly aim to elicit descriptions of participants' life and construction of their own personal narrative. This approach has been applied in topics such as engineering identity development among undergraduate students [40] and career aspirations and values among Black and Latinx students in science, technology, engineering, and math (STEM) [41]. Likewise, the narrative interviewing approach examines the storied experience, but considers the researchers' own stories as well. For example, Pawley [42, 43] has used narrative interviews to examine cultural and institutional narratives among engineering faculty and students, while Kellam, et al. [44] used narrative interviews to explore the role of emotions in undergraduate students' engineering programs.

We authors are primarily informed by phenomenological interviewing, in which we seek to elicit robust accounts of personal lived experience. When interviewing for this purpose, researchers aim to guide the participant to generate a first-hand account of their lived experience, in which they describe not only the content features of the experience but also in-depth accounts of how they experienced the content through emotions, immediate thoughts, or reappraisals. Specifically, the growth in framing research from the standpoint of descriptive phenomenology [45] and interpretative phenomenological analysis (IPA) [46, 47] in EER has contributed to rich explorations of lived experiences among students, faculty, and professionals. IPA, in particular, challenges dominant positivist ways of knowing through its roots in phenomenological, idiographic, and hermeneutic theoretical axes [1, 46].

In the context of phenomenological interviewing, researchers are often co-constructing or "intentionally walking with" participants to generate a detailed examination of lived experience. Descriptive and interpretive phenomenological studies in EER have spanned several contexts such as motivation [48], student learning experiences [49, 50], identity [51, 52], and the experience of professional shame [47, 53, 54]. All but two of these empirical IPA studies in EER used semi-structured interviews, with Huff and colleagues employing unstructured [53] and 'intensive, non-standardized' [47, p. 5] interviewing approaches. Several of these IPA studies noted that trained interviewers conducted the research interviews, often with undergraduate and graduate students observing. For our purposes, the interview questions we assessed here were unstructured, but were guided by the authors' understanding of the phenomenon under investigation through the perspective of IPA. Given the emotional and highly personal aspect of experiencing well-being and professional shame, the interview required vulnerability both from the interviewer and interviewee, highlighting the role the interview purpose played in the quality of questioning and data making [55].

Study context & methods

In this paper, we describe efforts toward the development and application of the IQRT, a tool we have used evaluate quality of a research interview in terms of interviewer skill development rather than the quality of the interview design. How one prepares and conducts an interview is dependent upon the methodological procedures used to collect qualitative data on a particular phenomenon. For example, a narrative study may employ a flexible interview agenda to make space for participants to lead their own storytelling [56], while an ethnographic interview may require more direct or conversational lines of questioning combined with enculturation behaviors and observation of interactions [57]. In the present case, the method for assessing interview quality was developed as part of a larger, ongoing research project that is using IPA. From the IPA perspective, in-depth, one-on-one interviews effectively allow participants to recount rich and detailed experiences in their lives [1]. The nature of semi- or unstructured interviews mean that things can and do change throughout the course of the interview, and so, while it is common to develop an interview protocol for an IPA interview, it generally serves the purpose of preparation for likely content and determining the appropriate order of questions rather than strict interview instructions.

The interview quality reflection tool (IQRT)

The development of the IQRT emerged as part of the ongoing IPA study examining the experience of professional shame among engineering faculty [58]. To build the IQRT, we analyzed one interview from the study that was conducted by the first author with a US-based assistant professor in engineering who was recruited via purposeful sampling through the authors' professional networks. The unstructured interview protocol was designed to elicit descriptions of the participant's 1) professional identity construction, 2) perceptions of socio-cultural expectations of engineering faculty, 3) experiences of failing to meet expectations as engineering faculty, 4) responses to experiences of those perceived failures, and 5) direct perceptions of professional shame. In preparation for leading the interview, the first author observed several interviews with other study participants led by her mentor and second author, who has substantial experience with conducting and analyzing unstructured interviews for IPA studies [51, 53]. The interview presented here as part of the discourse on interview evaluation was held via Zoom in the fall of 2022 and lasted 92 minutes. The interview was audio recorded, machine transcribed, and checked for accuracy prior to reviewing the quality of the interview. Although the questions prompted by the tool had been informally used by the second author, an experienced qualitative researcher who is faculty in engineering education, to mentor novice qualitative researchers, the efforts described in this paper represent the early efforts of testing the IQRT as a research tool and disseminating it more broadly to the EER field.

Using the IQRT

We now make clear how we used the IQRT to both self-evaluate the quality of the research interview and advance mentoring dialogue between the first and second author. An example of our use of the IQRT is depicted in Table 1, and we reference to a link to access a downloadable spreadsheet template of the IQRT [59].

To use the IQRT to evaluate the quality of interviewing, we first transferred a machine-generated interview transcript into a single column of an Excel spreadsheet with each interview question and corresponding participant responses segmented into a new row. Because we were more attentive to the interviewers' choice of wording, we manually re-transcribed her statements and allowed the participants responses to remain machine-generated. Then, for both questions and responses, we assigned an interviewer/interviewee designation, the associated timestamp, and the phase of the interview (i.e., introduction, course-of-interview, and debriefing) in corresponding columns. In our unstructured interview, we had organized our process by delineating goals that we held in the interview rather than a precise protocol.

In the IQRT, we categorized the statements made by the interviewer into question characteristics including question type (refer to Table 2), goal, and alignment with goal (refer to Figure 1). Question types included categorizing them as first as open-ended or closed. Additionally, we categorized the questions based on types defined by Smith and colleagues [1] (Table 2). As the general goal of interpretive phenomenological research is to elaborate on personal lived experience of a phenomena [1], tracking the questions types helped us reflect if the interviewer was strategically asking an array of questions that would help her achieve this overarching aim. Second, we examined how the question asked in this unstructured protocol aligned with the goals of the interview, which we had defined in advance of conducting the interview (refer to Figure 1).

By its nature, an interview conversation between two people (i.e., interviewer and interviewee) relies upon understanding language, the interplay of interpretation, and the interactive quality of seeking understanding around a phenomenon under investigation [60]. In addition to examining the nature of the interview questions, we also explored how they functioned in terms of contributing to the interviewee's understanding of the phenomenon. For each question, we reviewed the interviewee's response text before and after to examine whether the question introduced a new concept and/or detracted from the interviewee's flow of thinking either through language, interruptions, utterances, or non-verbal cues as well as external detractions such as phone ringing, pausing, going off record, or an interruption. We used three closed-ended questions to reflect on the interviewees: Was [the interview question] understood by the interview participant? Did it detract from their flow of thinking? Was a new concept introduced? Asking if the interviewee understood the question helped us to examine the mechanics of question-asking. While the goal of qualitative research is to generally be understood [61], it is possible that some interviewer questions invite intentional exploration of the interviewer's meaning in asking the question [62]. The next two questions that evaluated whether or not the interview question detracted from the flow of thinking or introduced a novel concept sought to examine the role of the interviewer in prompting the responses of the interviewee. While research interviewers will always introduce some novel concepts to the interview dialogue, we wanted to assure that we were tapping into the interviewee's readily accessible thinking, organized on their own terms [63], assuring strong pragmatic validity of the process [64].

Table 1. Example application of IQRT

Time-stamp	Interviewer question	Goal of question	Aligned with goal?	Was it understood by the participant?	Did it detract from the flow of their thinking?	Was a new concept introduced?	Concept introduced	Question type*	Open/ closed	Comment/memo
0:04:17	Um, so kind of first question is super open-ended. Uh, if you were to write a novel about your life, what would the chapters of that novel be?	Elicit overall concepts related to personal identity construction to obtain descriptions of distinct periods of his career that could be further probed.	Yes	Yes	No	Yes	Life as a narrative/ novel	Narrative; structural	Open	I declared the question as 'super open-ended', which I hoped would serve to not constrain the response and underplay my role as the 'nosy' interviewer. Notably, he replied with just a novel title rather than chapters, which I suspect emerged from his pre-conceived notions of what the interview would entail. Is it OK that he didn't describe distinct chapters, or out of my anxiety, did I overcompensate and ultimately miss the opportunity for him to define the pertinent stages of his career?
0:11:11	I'm trying to figure out how to ask this, but like, what was your process or maybe what, what feelings were you feeling in that moment? What was the emotion that you felt when you maybe needed help but you couldn't get any?	Elicit descriptions of how the participant experiences shame as an engineering faculty in relation to perceived expectations	Yes	Yes	No	No	--	Evaluative	Open	I asked far too many questions here (again, I was anxious!), which very likely led to some confusion as to what to answer (i.e., process or feelings?). Additionally, this question bordered on leading by using the somewhat loaded word 'emotion'. He did respond immediately with an emotion: 'frustrated', which was appropriate. It could have been more effective to simply ask, 'How did it feel when…'.

* Smith, et al. [1]

Table 2. Question types and descriptions (adapted from Smith, et al. [1])

Question type	**This type of question elicits…**
Descriptive	descriptive content from the interview participant
Narrative	a chronological sequence of events from interview participant
Structural	a way that the interview participant might structurally organize their thinking
Contrast	content related to how the participant considers to radically different experiences
Evaluative	appraisal statements about content, such as how the interview participant felt during previously described moment
Circular	content that requires the interview participant to consider other perspectives of their experiences
Comparative	content related to how their interview participant considers their lived experience in relation to other possibilities
Prompts	more experiential information related to a concept that was mentioned by the interview participant
Probes	descriptive content from the interview participant
Question types to avoid	**Reasons to avoid this question type**
Over-empathetic	It crosses the line from establishing rapport to conferring validation on the interview participant's lived experience.
Manipulative	It elicits content connected to the researcher's agenda rather than allowing the interview participant's content to stand on its own terms.
Leading	It reduces the scope of information elicited and risks the interview participant confirming the researcher's assumptions
Closed	It crosses the line from establishing rapport to conferring validation on the interview participant's lived experience.

After addressing the aforementioned prompts, the first author conducted an iterative process of self-reflection by examining the language, intent, and underlying thought process that led to each question in the form of brief memos in the spreadsheet as well as reviewing a memo written immediately after the interview itself. Such open-ended and reflective dialogue enabled the interviewer to freely dialogue about the quality of her interview technique in a way that was critical and yet constructive.

Goal 2: Elicit descriptions of how the participant understands sociocultural expectations of what it means to be engineering faculty. (Example questions: *What do you think it means to be an engineering [faculty member/professor]? Can you walk me through what other people expect of you as a faculty member?*)

Goal 3: Elicit descriptions of how the participant experiences shame as an engineering faculty in relation to perceived expectations. (Example questions: *How important is being an engineer faculty member to understanding who you are? Can you walk me through a time that you did not [meet the perceived expectations]? During that [episode], can you walk me through what you were thinking? feeling?*)

Goal 4: Elicit descriptions of how the participant responds to feeling shame in an engineering context. (Example questions: *If I were a fly on the wall during that [episode of shame], what would I have seen? What did others notice about you during that [episode of shame]?*)

Figure 1: Example of unstructured interview guide

Finally, throughout each step of the process, both authors engaged in a mentored process to discuss the application of the IQRT and reflect on the quality of the interview questions. Rather than having ambiguous discussions of assessing interview questions, the IQRT allowed for the process of interviewing to be made visible to both the interviewer and the research mentor, and they were able to the skill development on not only question mechanics but also skillful probing, giving silence and space, and adapting to unexpected situations. In sum, the IQRT enabled the interviewer to develop the skill of interviewing through self-assessment and the mentor to have a more holistic tool to engage crucial details of the interview process.

Reflecting on using the IQRT

Given the tacit skills involved in semi- and unstructured interviewing approaches, novice researchers may be challenged to evaluate the quality of how they adapted to the interview setting through the questions that they asked. Here, we reflect on key lessons learned based on four quality indicators of the IQRT: structure, content, context, and reflexivity. We then reflect on how the indicators can be used to form a researcher response for application to future interviews.

Structure: Looking beyond the protocol

The interview process relies on creating a comfortable space for asking questions and a willingness from both interviewer and interviewee to participate, listen, and respond. While interviews are sometimes viewed as 'collaborative' conversations between interviewer and interviewee [13], the interviewer needs to provide direction and structure to the interview. To do so effectively, interviewers should consider the environment in which the interview is conducted. The development and application of the IQRT provided an easy process for verifying whether certain logistic and structural requirements of the interview were met. For example, the interviewer confirmed the participant's consent to participate in the research interview, willingness to be recorded, and provided an opportunity for the participant to ask questions before immersing in the interview. However, upon reviewing the transcript, the interviewer proceeded with the questions before reiterating the research purpose and describing the types of questions might be asked and the underlying nature of the interview being semi-structured, open-ended, and mostly a one-sided but curious conversation about the participant's lived experience as an engineering faculty member. While the participant portrayed comfort and willingness to share openly *("I don't care. I'm gonna speak very freely."*) before the course of the interview, creating clarity about the environment at the start of the conversation may have provided structure to reduce 'pressure to perform'. While some direction is useful in creating a comfortable space for the participant, heavy handed direction through over-empathetic or leading questions can lead to a predetermined response from the participant. As such, this delicate balance between scaffolding the conversation and promoting flexibility within an interview conversation is a needed skill that interviewers can develop through practice and reflection.

Content: Examining the function of questions rather than the wording

One of the most valuable takeaways from self-reflection of the interview quality was examining how and why questions were asked, as well as what impact they had on the interview. Despite both familiarity with the interview protocol and prior observation of interviews exploring the phenomenon of professional shame, the experience of leading, listening, and responding within the semi-structured research interview was demanding for the novice interviewer. As a reflective practice, we compared the intended goals of the planned interview questions prescribed in the protocol versus the content of the actual questions asked during the interview, finding that for the most part, the interviewer's questions did align. However, in examining the underlying function, the IQRT illuminated a few instances where the interviewer introduced, sometimes unexpectedly, questions that detracted from the participant's flow of thinking. For example, in discussing the tenure expectations, the participant mentioned teaching, service, and raising money—a 'pillar' of tenure that he repeatedly framed as 'leverage' for 'threatening to leave'. Rather than probing experiences with raising funds to establish leverage, the interviewer directed the interview to teaching: "*Right. So if, if we dive into—well actually let's, let's dive into teaching. We haven't really talked about that too much. How, how does teaching play into the tenure process? Or, or how does teaching play into kind of the correlative 'work in equals work out' experience for you?"* Although teaching is a relevant and often salient aspect of the typical engineering faculty member's experiences, this participant had mentioned it only in passing. Instead, he expressed substantial sensitivity to the pressure he felt to raise funds as part of acquiring power in the course of meeting his tenure expectations. Notably, this question occurred 56 minutes into the interview, and the interviewer was cognizant of needing to reserve time to ask questions associated with the fifth goal of the experiment (i.e., direct perceptions of professional shame) and begin the interview debriefing process. Specifically, reflecting on this interview question gave rise to consideration of how to skillfully transition to the end of the interview without losing opportunities for additional insight.

Context: Managing emotional states throughout the interview

Researching difficult emotional experiences can elicit uncomfortable feelings among both the interviewee and interviewer. In the context of interviewing, where researchers and participants have little to no rapport with each other, navigating difficult conversations in an ethical, respectful, and scientifically robust way can prove challenging for the novice interviewer [65]. In the present interview example, a key aspect of self-reflection included examining the feelings and thoughts that emerged from confronting difficult facets of shame like failure, inadequacy, and emotional responses with a person the interviewer had never met. Through the process of self-reflection, the interviewer recognized feelings of anxiety that emerged in the interview as over-empathizing, gratification, and asking too many questions in one. For example, in the post-interview memo reflection focused on a point in the interview during which the participant disclosed a negative racialized experience, the interviewer recorded feeling of apprehension over respectfully prying into the painful experience as a white woman. This anxiety was evident in the questioning that followed, with the interviewer being overly gracious toward the participant for sharing and then nervously asking multiple questions at once. Although the participant did not

outwardly indicate discomfort with openly sharing the experience and even expressed feeling catharsis over disclosing it, reviewing this interaction emphasized an interview skill needing improvement, namely in managing discomfort and developing confidence and language around asking difficult questions.

Ultimately, practiced experience is needed to garner skill in navigating difficult topics within interviews. To help manage complex topics in interviews, Brinkmann and Kvale [66] suggest that new interviewers build skills in understanding ethical and cultural contexts within the interview to address them, avoid therapeutic intervention, and focus on the particulars of the interview (e.g., people, places, and time) rather than generalized assumptions. Meeting these lofty goals require experience, however, to bolster improvement, new interviewers can seek guidance from more experienced interviewers within their community. By the interviewer first self-evaluating her interview technique, we were able to sharpen the dialogue between us so that we could identify strengths of the interview process and specific areas for improvement.

Reflexivity: Propelling the mentoring process

Not only did the IQRT allow for intrapersonal reflection for the first author but it also afforded the opportunity for interview training to enter the mentoring dialogue between the first and second authors. Following the first author's self-guided reflection on their interviewing, both authors examined the completed assessment of the first author's interview. This dynamic process allowed for both researchers to consider specifically examine the strengths of the unstructured interview, such as moments where the first author elicited rich data concerning the phenomenon of professional shame. Additionally, it allowed for the first author to guide the process of eliciting constructive feedback from the second author by identifying moments in the interview where there was a struggle to elicit experiential data. Completing the IQRT allowed the first author to separate themselves from the interview process and facilitate a conversation where both the mentor and mentee were looking at the transcribed questions together. Thus, the IQRT drove a purposeful, non-judgmental, and reflective examination of the interview that carefully considered the interviewer's language and behaviors.

Research interviews can challenge novice interviewers to navigate the nature of loosely structured conversations that can bring with them unplanned participant behaviors, consequences of the interviewers' actions and subjectivities, and handling of sensitive topics [10]. By leading the mentoring dialogue with systematic self-assessment, our process contrasted with what we are aware to be more common processes of interview training, which prioritize an analytical focus on the research participant's responses rather than the statements from the interviewer herself. Further, our process of jointly analyzing the first author's role as an interviewer allowed for both authors to engage in a more constructive process about interview quality than if we had only focused on a protocol of interview questions.

Additionally, through this process of systematic process of self-reflection, we were able to focus together on the interviewer's language and behaviors adapted to the research participant rather than considering the precision of the questions themselves. Such quality considerations helped us recognize specific strengths of the interviewer in facilitating the data collection process and also

offer specific guidance for improving in their role as interviewer. For example, while we critiqued that introducing the concept of teaching in the interview may have detracted from the participants' flow of thinking, we also discussed the value in reflecting on the somewhat misdirected nature of the question and how timing the question near the end of the interview was a reasonable decision. In this way, our joint consideration allowed for gentle observation of the impact to the participants' flow of thinking at that point in the interview, ultimately deciding that the interviewers' question was not a major flaw, but a small, missed opportunity at the end of the interview. As EER continues to grow and employ a variety of qualitative research methods, novice researchers must develop language to articulate and examine issues of quality along with methodological competence [55]. By entering the mentored process of reviewing the interview questions together, we engaged in the opportunity to integrate conversations about research quality and skill development alongside our investigation of faculty members' rich lived experiences.

Conclusion

The IQRT presented is part of a larger research project investigating well-being among engineering faculty members and a formalized tool of the practice in the qualitative research lab in which the second author is principal investigator. We do not intend for this reflective tool to completely address validity or reliability concerns of data collection, but rather to focus on researcher development in order to strengthen the foundational skills needed to generate validity and reliability [55]. We recognize that the development and use of this tool in a particular study that adopts unstructured phenomenological interviewing may limit some features of the tool for use in a specific methodology. The purpose of this paper is not to defend its generalizability by inferencing a breadth of applicability. Rather, we approach the generalized use of the tool with a commitment to idiographic description, transparently describing the development and use of the IQRT and allowing for the qualitative researcher who reads this paper to integrate this tool with their practice. Through shared dialogue, we aspire for the IQRT to be a collectively constructed and useful tool for strengthening the skills and mindsets conducting semi-structured or unstructured interviews.

While existing literature provides guidance for developing interview protocols and tips conducting interviews, there are few resources available for scaffolding careful development of interview skills through the practice of self-reflection. Quality is essential to the qualitative research practice, but often the voice of the interviewer is juxtaposed to sought after participant data rather than considered as a valuable contribution to data making. Given how interview modes, structures, and purposes are interwoven into resulting interview data, it is essential that interview-based researchers attend to the skills needed to conduct them. Within the engineering education research domain, there are ample opportunities for contribution to building qualitative research method capacity. Given the discipline's foundations in engineering, EER brings a latent sensitivity to design. As practitioners carefully review design methods through mentored processes, so too must engineering education researchers scaffold the development of critical data collection skills.

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