Representing Researcher Identity with I-Poems

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Representing Interview Data with I-poems

Abstract

In this methods paper, we describe the use of participant-generated I-poems as a tool to represent data from qualitative interviews. I-poems are poems composed of I-statements a participant made during an interview. This form of qualitative analysis highlights a participant's voice and self-focused statements within a text. For our study, we adapted the I-poem method so that participants created an I-poem themselves from their interview transcripts to represent their researcher identities. It was important to us to use a participatory method of analysis because it gave participants agency in how their identities were interpreted and expressed. We believe participant-generated I-poems will be useful for researchers who want to learn about participants' beliefs in their own terms or those who want to use participants' knowledge as a lens to analyze the qualitative data they help produce. To that end, we discuss the methods and results of our study using I-poems to represent researcher identity as a case study to show how the participant-generated I-poem method can be used to analyze interview data in a new way. We recommend applying I-poems to other engineering education research agendas.

Keywords: poetry, participatory methods, epistemology

Introduction

In this methods paper, we describe the use of participant-generated I-poems as a tool to analyze interview data. We show how we used this participatory poetry method as a tool to provide new knowledge related to our engineering education research questions in alignment with our methodological and epistemic beliefs.

Qualitative researchers in engineering education often rely on interviews with participants as primary data sources to illuminate the social realities they study. These interviews typically allow participants to share in detail on the interview topic and to have some shared agency with researchers to direct conversation [1]. The result can be data which provide a rich description of a complex social topic. Interview data are typically analyzed by researchers who synthesize and interpret findings from a large amount of data to share with research stakeholders [2].

Thematic analysis or thematic coding is a common methodology for analyzing interview data across different approaches to qualitative research. In thematic analysis, researchers review interview data for recurring words, ideas, topics, or perspectives which are categorized into themes [3]. The results of the research are researcher-generated themes, which are often discussed with supporting examples from participant quotes. When using this method, researchers decide what participant statements mean, how to group them, and what to present. Even when participants provide feedback and consent to research products (member-checking), the methodology still positions researchers' perspective and sense-making as primary and participants' as secondary [4]. In addition to prioritizing the researchers' perspective, thematic analysis can also be reductive when it assumes information is best presented as a set of discrete categories rather than a unified whole [5], or when it becomes a tool to quantify the occurrence of themes [6]. Because of these potential limitations, we were intrigued by the possibility of a

poetry-based participatory methodology to provide an additional perspective on qualitative research data in engineering education.

Participatory qualitative methods represent a range of methodologies where research participants have authority and agency in the research process beyond providing researchers with data. One form of participatory research is community-based participatory action research, where researchers and participants work together in all aspects of the research process – from research direction and design to conducting a study, analyzing results and disseminating those results [7], [8]. Participatory research also encompasses designs that include participants in one or more aspects of the research process e.g. data analysis. Participatory research is an important way for researchers to decenter their own perspectives and center those of their participants [9]. Because of this epistemological shift, participatory methods are well suited to qualitative educational research because of the latter's focus on participants' personal experiences and inner attitudes – to which those participants have unique access.

I-poems are poems created from the "I" statements made by participants during interviews [10]. They offer an opportunity to focus on an interviewee's self-concept. Presenting I-statements in the form of a poem is valuable to communicate complex identities while inviting the reader to stand alongside the speaker in an emotional experience [11], [12]. Presenting interview data as I-poems also puts the reader in the position of listening to the participant speak about themselves [13]. I-poems have been used effectively to share the experiences of disabled cyclists learning to use recumbent bicycles [14], to discuss women's unwanted sexual experiences [11], and by researchers to theorize about their own experiences [15]. The form of an I-poem is a natural fit for participatory data analysis because it is designed to share the participant's self-referential voice. I-poems are one tool in a broad field of arts-based approaches in qualitative social science research that are well suited to participatory designs in engineering education research[16], [17].

In the next part of this paper, we describe how I-poems can be used to analyze qualitative research data using our own work as a case study. After the case study, we reflect further on the methodology and its potential for use in other engineering education research. Throughout the case study section of the paper, we will use the terms we and the researchers to refer to the two authors of this paper and the participants to refer to the two people enrolled in our study. Outside of our positionality statements, I will refer to the first author of this paper, Alexis Gillmore.

Case study: Representing Researcher Identity with I-poems

Research Context

In the work presented here, we aimed to learn how members of an interdisciplinary research team represent their identities as researchers within the team. We expected that the participant-generated I-poem method we employed would lead to unique results compared to common methods because it centers participants' own understanding of their experiences and identity, co-constructed during dialog with us as researchers [18]. We also hoped that the poems would function as symbolic objects - that reflecting on their poems would allow participants to express facets of their identity that would be difficult to speak about directly without the poem. This is similar to the use of photographs to facilitate conversation in photo voice methods [19], [20].

Positionality

Alexis Gillmore: as a PhD candidate in the natural sciences, I have participated on a couple multidisciplinary research teams where project work was highly individual. These isolating experiences made me interested in studying other ways that research teams collaborate to produce interdisciplinary works. I think my newness to research and role as a student have contributed to my desire to explore a new method for engineering education research as well as my hesitance to apply my own interpretations to data I am working with. When I read Inckle (2020) in a qualitative research methods course, I was struck by how the I-poems presented there were different than any other research findings I had read. I immediately wanted to explore poetry further as a medium for communicating research findings.

Courtney Faber: as an engineering education researcher, I have worked on multiple interdisciplinary and single discipline research teams. These teams took various approaches to collaboration. I found the greatest professional fulfillment and research impact on the teams where there was true collaboration and integration of ideas. These experiences and my research studying researcher identity and epistemic thinking have led me to my current research studying interdisciplinary engineering education research teams. Much of my research has used novel qualitative research approaches where I have integrated multiple qualitative methods or adapted approaches from other research fields to capture various aspects of social phenomena. When Alexis brought the I-poem method to my attention, I was immediately interested in exploring how the use of poetry as a reflective research tool could be used to study aspects of researcher identity.

Method

We recruited two study participants from an interdisciplinary research team to create I-poems representing their identity as researchers. This project was reviewed and approved by the University of Tennessee IRB under project ID UTK IRB-23-07628-XP. Alexis interviewed each participant about their identity and experiences doing research on their team. Then participants each created an I-poem using I-statements from their interview. Thirdly, interviewer and participants reflected together on the poems and the participants' researcher identities.

Our two participants work on a team in the College of Social Work at a southern research university. The team is working on a sponsored project to create a research consortium of stakeholders studying access, affordability and quality of early childhood education and care within their state. One participant, B, is a developmental psychologist with a PhD in psychology and experience as a preschool teacher. She dedicates 50% of her working time to this project and 50% of her time to other projects in the College of Social Work. The second participant, J, is an educational psychologist finishing a PhD in Educational psychology. He also has experience as a K-12 special education teacher. He works on this project full-time. There is an additional full-time member of the research team who did not participate in this project. While these two participants are education researchers working outside engineering education, they represent disciplines which may be involved on engineering education research teams.

Initially, I (Alexis) interviewed participants for roughly one hour each over videoconference. I used a semi-structured approach to ask each participant about their experiences and values as a researcher. Our research team developed the interview guide after we read Osbeck and Nersessian's [21] theory of epistemic identity and Longino's [22] theory of critical contextual empiricism. We revised the guide after watching recordings of interdisciplinary team meetings and looking for instances of researcher identity enactment. Questions in the interview guide covered six topic areas developed from the theorists contextualized by what we saw when observing teams collaborate: research background, current project, unique contributions to the team, relationships with teammates, feelings when collaborating, and ideals of quality research. We piloted the interview guide and poem process with two education researcher volunteers who agreed to be interviewed and create their own researcher identity I-poems. Pilot feedback was used to inform the interview guide and poem session instructions.

During interviews, I took advantage of the semi-structured format to ask follow-up questions related to the six topic areas or related to participant interest. I recorded interview audio. Recordings were automatically transcribed, then I corrected them. Participants reviewed their transcripts and modified them as they desired.

Each participant met with me individually to create an I-poem. I gave the interviewee a copy of their interview transcript with all instances of the words *I* and *we* highlighted. I also gave them a blank document with the instructions "Create a poem that expresses who you are as a researcher on this team using the I-statements you made in your interview. Feel free to edit your statements, add to them, or otherwise bend the instructions." The participant created a poem by copying statements from their interview transcript to the new document. I was available to answer questions as needed. My policies were to say "yes" to any interviewee requests and to avoid imposing limitations onto the poem. When the interviewee finished creating a poem, I asked them to share it with me.

After creating I-poems, the two participant teammates met with me over video conference for a group reflection to further discuss the I-poems created by each team member. First, each participant reread their I-poem and read the poem shared by their teammate. I prompted the two participants to reflect on their poems with questions such as: what does your poem say about who you are as a researcher?, what does your poem not say?, what from the poem would you like a research teammate to know about you? and what are your thoughts after hearing your teammate's poem?. In addition to answering the interviewer's questions, the participants also dialoged with each other about their poems and made unprompted observations.

Results

Below are the I-poems each participant made to describe who they are as a researcher.

B's researcher identity I-poem:

1 I didn't really know what I wanted to know.

r raidir treatily know what r wanted to kno

2 I didn't really know.

3 I didn't know what I didn't know. So,

4 I didn't think, I just did.

5 I did, and I did. And

6 I did some more.

8 I learned about thinking from doing.

22 I could read no more. 9 I learned about thinking. 10 I think. We think. He thinks. She thinks. 23 And then 11 I thought about thinking. 24 I cleaned and I thought. 25 I crunched, and I thought. 12 13 I learned about doing from listening. 26 I analyzed, and I thought. 27 And I learned. 14 I listened, 15 I learned, 28 16 I thought, and 29 I learned about helping from living. 17 I did. 30 I am a piece, a part, a fraction. 18 I listen. 31 I kneel, I stand, I hold, I support. 32 I learn and I listen and I think. 19 33 I think and I do and I help. 20 I learned about learning from reading. 21 I read and I read until 34 J's researcher identity I-poem: 35 I think that's what I mean Mesearch I think I think for sure I think, I think So I'm gonna do it ... that's the most I think, I think, I think important thing I don't know We are building trust I feel To keep their little brains moving I'm still just learning I'm in a hurry I think we're interested I'm always in a hurry I think we're interested in doing research I think we have to take our time that matters We are building trust ... that's the most I think that's the most important thing ... to important thing keep their little brains moving I think you know I wanna I talk too much I wanna, I wanna I think 1. I wanna, I wanna, I wanna I think I think I don't know, but I feel I'm always in a hurry I wanna, I wanna help you ... that's I try to slow down the most important thing I do my best to honor ... that's the most important thing I think we're still trying to figure it out I'm really interested in that, I think I think I'm too busy, but I wanna, I wanna, I wanna I kind of just love learning How can I help you ... we are building trust. I needed to learn I think that's the most important thing I'm just trying to figure it all out and see what there is to learn I guess So I'm gonna do it

I wanna, I wanna, I wanna help you I'm always in a hurry I try to slow down We are building trust
To honor ... that's the most important thing

1

Discussion of researcher identity

The first author of this paper and the two participants discussed these I-poems together to reflect on the poems as a tool for representing researcher identity. Based on this demonstration, the initial interviews seem to be effective to enable participants to create researcher identity I-poems. Before further exploring what is expressed about researcher identity by the poems, it is important to establish that both participants were satisfied that the I-poems they created did represent their identity as researchers.

B: "I definitely feel like this is accurate, and this is reflective of my identity as a researcher, as my identity is part of this research team. And all of that, I definitely feel like it came from a very real, very genuine place. So yeah, I do think it's right. But but I also think that it encompasses more than just my part in this new team. I do think it is also just reflective of me as a researcher over all"

J: "But, but in that kind of act of creation it felt it felt true to me as well. ... So yeah, I think I think that there's a lot of you know, lot of truth."

In reflecting on the I-poems, both participants shared what their poems expressed about their individual researcher identities. J described that his poem captures his motivations as a researcher:

"I just I just wanted to do this [educate children] better. I wanted to know how to do this better, and it was a little insatiable. You know, a little like I just got to do this, you know, drive so I wanted to reflect sort of the, the insatiability of that, sort of like engine that would make one get a PhD..."

- "... You know what society has told me, how important my thoughts are. To slow down that, and, and make sure I'm a, you know, a listener in that as well."
- "... Ultimately it is about doing something good for other human beings, right, whatever we're working on, and that if I stumble along the way because my ego gets in the way, or because I get fixated on a solution, or because I just don't understand something, I would hope that we've had enough, built up enough timing that they can trust that, that it's, ultimately for me it's gonna be about what, how we can provide value."

B said the poem expresses her identity as a researcher based on the experiences and interactions she has learned from:

"I kind of see myself as a jack of all trades, master of none. And it's really not about any one particular domain or research question."

"...rambling stream of consciousness. Don't really think, just do. Sort of that's kind of how I get by in life."

"I fully think about and respect that all of the individual pieces and components that make up who I am as a person have influenced where I am in life. Everything that I've gotten to do up to this point, and everything that I will do after this point. It's not just all due to my hard work or good luck, but it's very much due to who I happen to be. You know. One individual..."

"A large part of the research experience is, we don't oftentimes have people who know the exact things that we want to know. And so, instead of going out to find somebody to teach it to us. We have to go out and find ways to learn it...And I historically have learned a lot just by listening, listening to others. And very obviously, taking what I listen and incorporating it and adapting it."

B and J focused on the impact of their PhD experiences on their I-poems. Work in their current research team feels very different than work as students because they experience more stability in their jobs and because they enjoy collaborating among equals.

J: "I also think our poems are marked by the PhD process still. Like research, like when we, the 3 of us, K, B, we research - like it's not as- there's very few tiers generally speaking, there is a not as much disparity. It's just more fun. It's easier. It's more fun, you know. Somebody else comes up with a great idea. You're like, Oh, my God, that's awesome."

B: "I think something that's really important to point out is, the three of us are in very similar places and J's just about there, where K and I just 2022 completed our degrees. And so we're kind of in the aftermath of those feelings and experiences, if you will. But and and J is right he's right there."

J: "And I'm in the math."

B: "Well, because our careers aren't on the line in the same way. They're on the line every day with our, with our work product, but not in the same way where it's like you either deliver or you leave the program, and then you have to figure it out. So I mean, the stakes are, are different."

J: "We get to read and write for a living about things that matter to us with people we care about. I mean, you just can't ask for a lot more than that."

B: "100%. It's a gift."

Doctoral research is a very recent experience for both participants. They both acknowledged that their researcher identity poem would likely change completely with another 10 years of research experience. The emphasis on comparing doctoral research with professional team research in our conversation may have been related to the interviewer's role as a PhD candidate in addition to the participants' proximity to their own PhDs.

Both participants also noticed that their I-poems do not say everything about who they are as researchers. Details of the research process and deviations from the ideal process are left out.

J: "...in the poem, there's this sort of a big picture like what, what you know. I think one of the things that research has has, I've had to learn to be a better researcher is I can really look at the detailed parts of something. I like a big picture. I wanna figure something out, I want- And once I have my answer, I kind of lose interest. But you know, as a as a researcher, you really can't you know, the details matter a lot like what, for lack of a better term, you know, what is the p-value? What is the effect size? What is the actual data? You know the actual nitty-gritty, if you will, before- so I feel like that that tension in the big picture versus real specific. That's been, that's a st- an abiding struggle in my being a good researcher."

B: "what did not make it into there is everything else that I actually experience. Like this is more like what I would like to happen if things actually, you know, went well. But I've said this a lot recently, and it holds true: I don't think I ever have a typical research day, because every day is different."

Reviewing the poems as the researchers, we also noticed that both participants left out demographic identity information like race, ethnicity, gender, or age from their poems. Neither participant included their academic discipline, credentials, employment, or details of their current research project. In doing so, the participants distinguished what they saw as their researcher identities from other identities. J and B both indicated that their researcher identities are more general than their roles on their current research project. in their analysis of the poems, B and J also emphasized the skills and values that they use as researchers rather than project specifics.

B: "All of it is, is related. But my different, the different areas that I have really come to focus on as a researcher all the way from my post-bach research to now, they have been disparate areas of study. And so I kind of see myself as a jack of all trades, master of none. And it's really not about any one particular domain or research question. It's more about my identity as a researcher and being faithful to who I am and the and what is important to me, which are, you know, transparency and science, and, and all of that..."

J: "You just, I feel like you're still looking to use a set of skills to help, to make better, to improve, to figure out, to learn to add to the field. So it really isn't about the question. It's about the process, I think for, for me."

To get another sense for the scope of these researcher identity I-poems, we compared I-poem statements to the sections of the transcript they originated from. Sections were derived from our six theoretical aspects of researcher identity. We noticed that neither poem included statements related to the *feelings when collaborating* section of the initial interviews. Both participants mentioned feelings they have while researching and collaborating on a team in their initial interviews but did not use these statements in the poems. We plan to explore the area of *feelings when collaborating* further to learn more about how researchers might disclose these emotions, how they could appear in poetry, and how they relate to researcher identity. The two poems presented here evoke emotion in the reader or imply emotion of the speaker without directly stating those emotions. The other five sections of the transcripts were represented in the poems to varying extents. The *current project* section was least clearly represented in the poems, while the

relationships with teammates and ideals of quality research sections were most frequently represented. It is interesting to note that the current research project did not feature heavily in the participants' poems, but relationships with teammates on the project did.

After presenting this research project as a case study, we would like to share more about the poem method itself and encourage other researchers to try out poetry in their research.

Discussion of I-poem method

During this project, we learned more about how I-poems function as a tool to represent researcher identity. We found that the form of poetry communicated very differently than the prose interview transcripts, with heighted emphasis and emotional weight. We also saw that the participants transformed the context and meaning of their words to create their I-poems, drawing on their closeness to the subject matter. The two study participants took different approaches to creating their poems. One poem is composed almost entirely of I-statements said by the poet in their initial interview. The other poem was written from new statements inspired by I-statements that poet said in their interview. Table 1 shows four examples of I-poem excerpts and the related statements in initial interviews.

Table 1. I-poem text compared to source statements

| Author | I-poem excerpt | Initial interview statement |
|--------|-----------------------------|---|
| В | I didn't really know what I | "I didn't really seem to have a strong drive to a |
| | wanted to know | particular area of research like, so what I mean by that |
| | | is I didn't really know what I wanted to study. I just |
| | | found general interest in a lot of things." |
| В | I cleaned and I thought. | "It was really hard to collect good, clean, usable, |
| | I crunched, and I thought. | usable data. But, oh, my team and I, we figured it out |
| | I analyzed, and I thought. | and we did it. And we have one paper already |
| | | published on it, and we're working on another. And I |
| | | feel like it's actually advanced our understanding, and |
| | | yeah, I'm super proud of that work." |
| J | I think | "Hmm, I mean, I think, I think I'm doing the best |
| | I think, I think | research right now that that I've done" |
| | I think, I think, I think | "And I don't know if I want, I'm not sure that's a really |
| | I don't know | good path for me" |
| | I feel | "I mean I think I feel heard. I feel respected. I feel |
| | | valued for sure." |
| J | I needed to learn | "So in other words, especially if you're a middle school |
| | | student, and you think well, my student, my teacher |
| | | understands what, how I needed to learn." |

The first excerpt from B's poem shows how she was able to condense her speech from our interview into a more concise poetic form. The line of the poem communicates similar information with a more direct tone. That directness is part of why B's poem feels as if it is cutting to the heart of the matter and sharing what is most important about her researcher

identity. The second excerpt from B's poem exemplifies how she was able to rewrite what she wanted to communicate into a poetic form. Parallel structure and repetition in the poem communicate the difficulty of collecting, analyzing and presenting research data more directly and emotionally than the original prose. If we composed an I-poem from B's interview transcript ourselves, we would have followed our own rules to use only direct quotes from the transcript. We would have missed this opportunity to write better poetry, which B took advantage of.

The first excerpt from J's poem shows how he was able to use "I think" statements as part of the core of his poem. As researchers analyzing an interview transcript, we would have seen these "I think" statements primarily as filler words, part of extemporaneous verbal speech which does not have much intentionality behind it. We would likely have edited them out of an I-poem if composing it ourselves — but in J's composition they become the opening point for his poem and introduce J as a researcher who thinks. The second excerpt from J's poem shows another transformation of meaning. In the interview, J was speaking hypothetically from the perspective of a student about what they experience in a classroom. When creating his I-poem, J claimed this statement as his own to express his own researcher identity.

While we as researchers could adapt the participants' transcripts into a poetic form, making the kinds of transformations of meaning displayed here would not have been appropriate for us as researchers based on our limited knowledge of the participants' researcher identities. Because of their ownership over their spoken words, the participants were able to reimagine the words to create something new in their poetry, revealing new information about their researcher identities.

The method of creating and reflecting on I-poems was also valuable to us because we heard from the same participants three times. Reflecting on the initial interview transcript to create a researcher identity I-poem and then reflecting on the I-poem in conversation gave the participants opportunities to step outside themselves and talk about the choices they made to express their identities. For example, in our reflection on the I-poems, B pointed out that her poem reflected an idealized story about her researcher identity:

- B: "My poem is a very idealized version of my research process, and what did not make it into there is everything else that I actually experience like this is more like what I would like to happen if things actually, you know, went well. But I said this a lot recently, and it holds true. I don't think I ever have a typical research day, because every day is different... Yeah, there, there's no crying in there for one part, and crying has always been a part of my research process. There's no tantrum. There's no cussing, cursing. There's no taking naps. I mean all many of the things that are part of my my day to day are not in there."
- A: "Could I ask, maybe, why-I'm not sure if this is quite the right question. But maybe why did you write the sort of idealized version for the poem and not the, the other stuff?"
- B: "I think my identity as a researcher is challenging to me in a couple of ways, one, because it was created in the idealized environment that is this kind of ivory tower that we all live within. And so we've, we create these identities that are in some ways masks of our true selves in order to meet the expectations of the overall cultural, you

know, cu- academic culture..." "And it's less about being a researcher specifically. It's more about like just how I get through the day or get through my life..."

Because our study participants were part of the synthesis of and reflection on their initial interviews, they were able to share more with us that we did not hear in the initial interviews.

Both participants indicated their respect for the ambiguity of poetry as a medium and did not wish to force their poems into a single interpretation.

J: "I feel like poetry, you know, if I read, that I automatically interprets it. Whereas if B reads it, then she gets to take what was on there and interpret it for her. So it is, you know, the, the reader's voice sort of adds to the interpretation a little bit. I feel like, which, some people want to do in their poems. But isn't, isn't kind of how I grew up thinking about poetry."

B: "And I think that it's very applicable in, at all levels, which is why my brain was automatically like But, but who is it? But who is he talking to? me? Is he talking to somebody else? And, and I don't need an answer. I think that's the great thing about poems, is you, you don't get an answer. You kind of have to interpret as you will." J: Yeah, it was definitely intended to be multivalent. Right. I mean it is. It is at every level."

This ambiguity makes poetry well-suited to discussions of identity – which is nebulous, changeable, and multivalent itself. As researchers, we might have been pulled into trying to spell out information unambiguously to share conclusions and takeaways with others. The participants were able to use the structure of the I-poem to respect the multiple meanings and multiple interpretations they had in mind when representing their researcher identities.

We believe this participatory I-poem process succeeded in providing us a new perspective to view and discuss researcher identity within an interdisciplinary research team because the resulting poems are unlike what we would have produced by using a method like thematic coding to analyze interview data. Yet, these participant-generated I-poems about researcher identity demonstrate that poetry is not a tool to answer research questions in a simple or definitive way. The unique form of the I-poems communicates information in a different way than themes, quotation, or narrative does. The participants' unique role in analyzing their own data allowed them to make analytical decisions based on their close relationship to the data to shed further light on the matter. Instead of a structured answer to a question, the poems provide more questions and may evoke insight into the authors' experiences of their researcher identity.

Limitations and future work

A fully participatory research design would integrate researchers and participants in all aspects of the research so that the project addressed questions important to the participants and so that research outcomes rewarded participants. This model of participatory research helps ensure research results are accessible to stakeholders and are translated into practice [8]. We extended participant authority to only one aspect of the research process — to assisting the researchers in

data analysis. While we were able to benefit from the participants' closeness to the research topic, the participants did not have any particular investment in the design of our study or its outcomes. There is great potential for more fully participatory studies in engineering education, and we hope other researchers keep these possibilities in mind when designing their studies.

We conducted this study with two members of an interdisciplinary team and learned how I-poems can work as a tool to express researcher identity. The two participants are both trained psychologists, and B considers herself extensively experienced in reflecting on her thoughts and feelings, partly because of that training. B has not written poetry beyond high school English classes, nor does she go out of her way to read poetry. J was not available to comment on these matters. Both participants are native English speakers. There are many more possibilities for how other individuals might create I-poems and engage with the reflective process. When we piloted our I-poem process with two other education researchers, one of the resulting poems was stylistically distinct from the two presented here – using the form of full sentences and communicating with a distinct tone. We hope to see more of these possibilities by talking to more people and encouraging the creation of more I-poems.

We also hope to learn more about how these I-poems could be used to develop communication on interdisciplinary teams by expanding our work to include other teams of researchers. For instance, both participants were professional researchers collaborating as equals; we would like to know how undergraduate or graduate students might engage in the poem-creation process when working on teams with more experienced researchers.

Implications for research

After reading the participant generated I-poems above, we would ask you to reflect: What stood out to you when reading the poems? What do you feel? What did you like or dislike about the poems? In this paper we have made a case for using participant generated I-poems to supplement other forms of qualitative interview analysis and provided a guide to do so. Poetry can offer a unique window into human experience that may be missed by other forms of communication or analysis. Poetry expresses emotion and respects ambiguity in ways that traditional qualitative analyses might not. Participant generated poetry allows participants greater autonomy over how their data is interpreted and expressed than some other forms of analysis. These attributes make participant-generated poetry a useful tool for those researching social systems. We invite you to consider the role poetry could play in your research and educational projects. We are curious about poetry as a tool for reflection and conversation in the classroom, poetry as a tool for team development, poetry as a tool to connect emotion to engineering classroom knowledge, and I-poems as a tool to amplify counter-narratives in engineering culture.

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References

- [1] M. E. Brenner, "Interviewing in Educational Research.," in *Handbook of complementary methods in education research*, J. L. Green, G. Camilli, and P. B. Elmore, Eds., Lawrence Erlbaum Associates Publishers, 2006, pp. 357–370. Accessed: Jan. 29, 2024. [Online]. Available: https://psycnet.apa.org/record/2006-05382-021
- [2] M. Q. Patton, "Chapter 8: Qualitative analysis and interpretation," in *Qualitative research* and evaluation methods, 3rd ed., Thousand Oaks, California: SAGE Publications, 2002.
- [3] J. Saldana, *The coding manual for qualitative researchers*, 4th ed. Thousand Oaks, California: SAGE Publications, 2021.
- [4] W. E. Smythe and M. J. Murray, "Owning the Story: Ethical Considerations in Narrative Research," *Ethics Behav.*, vol. 10, no. 4, pp. 311–336, 2000, doi: 10.1207/S15327019EB1004_1.
- [5] D. Hammer and L. K. Berland, "Confusing Claims for Data: A Critique of Common Practices for Presenting Qualitative Research on Learning," *J. Learn. Sci.*, vol. 23, no. 1, pp. 37–46, Jan. 2014, doi: 10.1080/10508406.2013.802652.
- [6] A. J. Kleinheksel, N. Rockich-Winston, H. Tawfik, and T. R. Wyatt, "Demystifying Content Analysis," *Am. J. Pharm. Educ.*, vol. 84, no. 1, pp. 127–137, Jan. 2020, doi: 10.5688/AJPE7113.
- [7] A. Navickis-Brasch *et al.*, "Restoring Water, Culture, and Relationships: Using a Community-Based Participatory Research Methodology for Engineering Education," in *2014 ASEE Annual Conference & Exposition Proceedings*, ASEE Conferences, 2014, pp. 24.1047.1-24.1047.15. doi: 10.18260/1-2--22980.
- [8] S. Coughlin, S. Smith, and M. Fernandez, "Overview of community-based participatory research," in *Handbook of community-based participatory research*, 1st ed., Oxford: Oxford University Press, 2017, pp. 1–10.
- [9] S. Secules, "On the importance of (white) humility: Epistemological decentering as a positional orientation toward research," *J. Eng. Educ.*, vol. 112, no. 2, pp. 258–261, Apr. 2023, doi: 10.1002/JEE.20508.
- [10] C. Gilligan, "The listening guide method of psychological inquiry," *Qual. Psychol.*, vol. 2, no. 1, pp. 69–77, 2015, doi: 10.1037/qup0000023.
- [11] L. E. Koelsch, "I poems: Evoking self.," *Qual. Psychol.*, vol. 2, no. 1, pp. 96–107, Feb. 2015, doi: 10.1037/qup0000021.
- [12] P. N. Johnson-Laird and K. Oatley, "How poetry evokes emotions," *Acta Psychol.* (*Amst*)., vol. 224, p. 103506, Apr. 2022, doi: 10.1016/J.ACTPSY.2022.103506.
- [13] R. Edwards and S. Weller, "Shifting analytic ontology: Using I-poems in qualitative longitudinal research," *Qual. Res.*, vol. 12, no. 2, pp. 202–217, Apr. 2012, doi: 10.1177/1468794111422040/ASSET/IMAGES/LARGE/10.1177_1468794111422040-FIG5.JPEG.
- [14] K. Inckle, "Poetry in motion: Qualitative analysis, I-poems and disabled cyclists,"

- *Methodol. Innov.*, vol. 13, no. 2, p. 205979912092498, May 2020, doi: 10.1177/2059799120924980.
- [15] J. L. Wiggins and G. Monobe, "Positioning Self in 'figured worlds': Using Poetic Inquiry to Theorize Transnational Experiences in Education," *Urban Rev.*, vol. 49, no. 1, pp. 153–168, Mar. 2017, doi: 10.1007/S11256-016-0386-5/METRICS.
- [16] T. Barone and E. W. Eisner, Arts Based Research. SAGE Publications, 2011.
- [17] M. Cahnmann-Taylor and R. Siegesmund, Eds., *Arts-Based Reserach in Education: Foundations for Practice*, 2nd ed. New York, NY: Routledge, 2018.
- [18] Y. S. Lincoln, S. A. Lynham, and E. G. Guba, "Paradigmatic controversies, contradictions, and emerging confluences revisited," in *The SAGE handbook of qualitative research*, 4th ed., N. K. Denzin and Y. S. Lincoln, Eds., Thousand Oaks, California: SAGE Publications, 2011, pp. 97–128.
- [19] D. R. Simmons, M. Polmear, H. Bae, and C. McCall, "Applying a New Lens: Using Photo Elicitation in Construction Engineering Management Research," *J. Constr. Eng. Manag.*, vol. 148, no. 8, p. 04022074, Aug. 2022, doi: 10.1061/(ASCE)CO.1943-7862.0002334.
- [20] J. Kaminsky, "Institutionalizing infrastructure: photo-elicitation of cultural-cognitive knowledge of development," *Constr. Manag. Econ.*, vol. 33, no. 11–12, pp. 942–956, Dec. 2015, doi: 10.1080/01446193.2016.1167927.
- [21] L. M. Osbeck and N. J. Nersessian, "Epistemic identities in interdisciplinary science," *Perspect. Sci.*, vol. 25, no. 2, pp. 226–260, 2017, doi: 10.1162/POSC_a_00242.
- [22] H. E. Longino, *The Fate of Knowledge*, 1st ed. Princeton, NJ, USA: Princeton University Press, 2002. doi: 10.1515/9780691187013/HTML.