

Through 'Collaborative Autoethnography': Researchers Explore Their Role as Participants in Characterizing the Identities of Engineering Education Graduate Students in Canada

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Abstract

This research paper is an examination of four researchers’ methodological approaches to an explanatory case study investigating the identities and experiences of the graduate student population engaged in engineering education scholarship in Canada. The researchers are members of this target population from four separate institutions across Canada. To attend to procedural validation, we have engaged in a collaborative autoethnography to explore how our dual identities as researchers and future participants have shaped our study design and survey items. Using qualitative research development documents, this research paper critically explores our experiences as both participants and researchers. We position our study within Walther, Sochacka, & Kellam’s process-oriented quality framework for interpretive research, identifying our roles, influences, and biases in order to develop methodological awareness, and make transparent our subsequent knowledge generation. Initial findings are interpreted through the lens of situated learning theory, and the conceptualization of an underdeveloped community of practice leading to an identity quandary. These findings will be used to inform the development of our larger research study.

1. Introduction, Background and Motivation

With the increased emphasis on outcomes-based education, Engineering Education (EngEd) is a growing field of study in Canadian universities, with interest from graduate students expanding rapidly in the past few years¹. However, there are very few formal programs in EngEd across the country. Therefore, many of these students find themselves housing their studies in traditional engineering departments, all the while engaging in research that is often epistemologically and theoretically different from their institutional peers, and their supervisors. Due to this newly developing community of practice², and the limited number of experts in the country, it is hypothesized that many of these students may not have day-to-day EngEd communities, and therefore the academic and research identity of an EngEd graduate student in Canada is left largely to the student to construct. As students negotiate this emerging field, the interest in this greater research study is in how these individuals form their EngEd identities, and how these identities intersect with other EngEd graduate students’ identities in Canada.

This larger study was initiated by a group of Canadian EngEd graduate students from four institutions across Canada. It is designed as an exploratory case study with two distinct phases and methods of data collection. The first phase comprises an on-line survey with high-level reflection/qualitative questions and low-level reflection/quantitative questions. The second phase will be a narrative analysis of individuals’ stories derived through semi-structured interviews using a protocol constructed from the analyses of the survey data. The survey was built using McAlpine and colleagues’ identity-trajectory framework³⁻⁵, which accounts for the interconnectivity of the intellectual, institutional, and networking influences on a student’s identity. The findings from these two phases will be used to describe the diversity of identities of

students studying EngEd in Canada, and to ascertain challenges and opportunities that exist for them in this developing and unfettered field¹.

As a function of the overall study, we, the researchers, are members of our sample population. Consequently, there is a relationship between our identities and experiences as self-described EngEd graduate students in Canada, our roles as researchers, and how we envision and subsequently designed our study. Positioning ourselves as participants and researchers in this study and partaking in introspective practice enables us to critically reflect on the ‘making and handling of our data’⁶. To facilitate critical reflection, we have engaged in the process of collaborative autoethnography^{7,8} in this research paper to increase our understanding of the elements that informed the development and design of our larger study, and thereby attend to the procedural validation of the work⁶.

Using meeting documents, survey development notes and critiques, our survey responses, and the handwritten notes that we logged over our two-year research process, we critically reflect on our experiences as both participants and researchers. We position our analysis within Walther, Sochacka, & Kellam’s process-oriented framework to foster quality in interpretive EngEd research, identifying our roles, influences, and biases in order to develop ‘methodological awareness,’ and make transparent the subsequent generation of knowledge⁶. The research question that emerged from this process and which forms the focus of this research paper is

How have our experiences as researchers and participants shaped our study?

The findings will guide us as we proceed with our larger study.

2. Literature Review

Research on graduate student identity has become a focus in past years as a way of understanding how students negotiate the influences of institutions and circumstances on their intellectual and personal development to cultivate their academic/professional identity^{3,9-11}. The identity of a graduate student is in and of itself provisional – a temporary identity taken on as a means of transition into a professional identity¹². This transient identity can be ill-fitting when students find themselves taking on roles that are uncomfortable or contradictory, numerous and potentially competing, including, but not limited to teacher, researcher, writer, mentor, mentee, and service roles within their institutions¹³. This is especially challenging while students are seeking opportunities for support, and occasions to join professional communities to develop their academic/professional identities^{14,10}. Unfortunately, completion rates for PhDs are low¹⁵, and the effect of students’ institutional support systems and communities has been cited as one of the factors influencing successful/unsuccessful completion of doctoral degrees¹⁶.

Community of Practice

The concept of community of practice has been developed through the work of Lave and Wenger² and their theory of ‘situated learning.’ It is an important theory for explaining how the ‘novice,’ through legitimate peripheral participation, moves from the margins of a community into the centre, achieving status and finding their identity as ‘insiders’ of the community. A graduate student can be considered a ‘novice.’ In a new community, a novice is located on the

outskirts, or ‘periphery’ of the community, and steered into the center with the guidance and support of the experts within. Through the adoption of various roles and responsibilities, the engagement in networking, in determining opportunity structures and horizons for action, ‘inbound’ participants are sent on a trajectory toward ‘expert’ status. The result of traversing the community of practice is the formation of a ‘practice-linked identity,’ which is embedded in the community, and in its social and cultural norms.

3. Methodology

This study builds on other studies that have looked at the identity development of graduate students¹⁷⁻²⁷. It is important to ensure we both accurately represent the identities and experiences of our target population, and are aware of our own biases as we make and handle the data⁶. Thus, to explore our processes and the design of our study, we employed the qualitative research method of collaborative autoethnography, as well as Walther, Sochacka, and Kellam’s framework to foster quality in interpretive engineering education research⁶.

Collaborative Autoethnography: Exploring Researchers’ Influences on the Study Design

This study-within-a-study has been designed as a collaborative autoethnography (CAE). CAE brings together three distinct research methods and approaches, and merges them into one: autobiography, the study of self; ethnography, the study of culture; and collaboration, the interaction of a group. It is a method that ‘enables a group of researchers pooling their stories to find some commonalities and differences and then wrestl[e] with these stories to discover the meanings of the stories in relation to their sociocultural contexts.’⁷ In this regard, CAE is a suitable method for our study, where we are intent on understanding, through the disclosure of individual identity and experience, the sociocultural context of the EngEd graduate student world where we reside.

Framework to Foster Quality in Interpretive Engineering Education Research

As the focus of this research paper is on ‘the role, influence, and possible bias of the researcher,’ it was fitting for us to explore the process-oriented framework that Walther, Sochacka, & Kellam conceptualized and to attend to the procedural validation of our research process⁶. Walther et al. situate their framework in the understanding that ‘the nondualist ontology of interpretive research demonstrate[s] that neutral observation is, in principle, impossible.’⁶ Through the process of writing this research paper, we are developing ‘methodological awareness’ by explicitly reflecting on how our own experiences created biases in developing the survey, which will ultimately support us in ‘fostering a deeper understanding of the social system under investigation.’⁶ The qualitative framework conceived by Walther et al., and used by other EngEd researchers in their treatment of their interpretive data,^{8,28} is conceived in a matrix of theoretical, procedural, communicative, and pragmatic validation, and process reliability, across two research processes: the making and the handling of the data⁶. For this research paper, we will focus on theoretical, procedural, and communicative validation, and process reliability.

Survey Development

For the first phase of this study, we iteratively designed an on-line qualitative survey informed by McAlpine and colleagues' identity-trajectory framework. Once we were satisfied we had 'completed' the survey, each researcher piloted the survey to experience it from both a participant and researcher's perspective. We recorded two types of reflective responses during this process. Firstly, we suggested revisions, which ranged from large structural and content issues to smaller style and mechanical issues. Secondly, we each kept track of our cognitive, emotional, and behavioural responses to both the content derived from, and process of completing the survey. Throughout our two-year research process, we kept individual research logs, meeting documents, and Excel spreadsheets tracking the identity-trajectory conceptual framework development and survey revisions. All of these documents were shared concurrently as they were produced via emails and Dropbox.

CAE Study Process

On deciding to investigate our dual roles in our larger study, we employed CAE and implemented a process to explore our researcher-participant subjectivity. One researcher developed the research protocol, which comprised of four questions derived from several influences, including Allendoerfer et al.'s interview protocol for their study, *Becoming an Engineering Education Researcher: Finding Pathways Toward Interdisciplinarity*²⁹, as well as harnessing the traditions of narrative research³⁰ and autoethnography³¹. We directed each other to reflect on the following questions, and complete a textual analysis of our survey responses:

1. Record what you are currently struggling with in regards to your identity as an Eng. Ed student. What are the parts of your identity that you enjoy owning and want to be championed for? What parts of your identity would you like to disassociate with?
2. Review your comments in the excel files:
 - a. What are the topics of your comments?
 - b. What is the tone of your comments?
 - c. What in your history/identity has defined these topics/your attitudes towards these topics and made them important/unimportant?
 - d. What are the topics of the survey that you responded to most strongly? Least strongly?
3. What did you discover about yourself from the holistic process of building the survey?
4. Look at all your answers and thematically code them using examples and thick descriptions.

Once we completed our reflections, we met virtually to discuss the protocol and to collectively share our data, while three of us kept field notes. At the conclusion of our two-hour meeting, these field notes were compiled into one document that we all agreed captured our discussion. This document, as well as our four individual reflections, were the data that one researcher analyzed. Data were analyzed using a constant comparative thematic coding cycle that extended to cross-case thematic coding³⁰. For the establishment of communicative validity, we engaged in

a ‘systematic and sustained engagement with the respondents’ accounts.’⁶ The initial codes were in vivo, and through the negotiation of meaning and consensus established within our research community, and interaction with the literature, the codes moved towards more ‘abstract interpretations and the subsequent formulation of theory.’⁶

A rich data set emerged from this process. For the purposes of this research paper, the findings will focus on the presentation and discussion of one bias for each researcher that was ostensible in the survey.

5. Findings and Discussion

In our analysis of our autoethnographic ‘products’ – our individual and collaborative reflexive data – a prevalent collective theme that emerged was our identity quandary (triggered by our desire to belong to the EngEd community): our questioning of the legitimacy of the field, and our questioning of the legitimacy of ourselves as members of the community and as EngEd researchers. The narrative constructs below are reflective of a portion of our data set, and demonstrate the individual concerns that evidently influenced our survey development: areas of tension in our exploration of identity that transcend into areas of emphasis in the survey.

Researcher 1: *I feel strongly that engineering provided me with a special and unique skillset, and am trying to figure out how this ‘specialness’ applies to the new [EngEd] group in which I belong. However, I lack confidence in my own identity and skills, and may choose to not defend my engineering identity in order to avoid conflict.*

Researcher 2: *Postponed journeying through the reflective process because of my doubt regarding the validity of engineering education as a subset of engineering research; therefore, I needed to keep the survey at arm’s length. I focused on the formatting aspects, and was the researcher who often voiced that I was uncomfortable with certain questions - particularly when they were the ‘heavy’ qualitative questions that forced me to think through my own feelings about EngEd (i.e. What type of reactions do you get when you explain your masters/PhD to others?). Many of my additions to the survey were focused on discovering if participants have solid support structures and whether or not other EngEd graduate students lacked confidence in the research area and/or felt disrespected - likely because I struggle with this myself.*

Researcher 3: *[I] need to explore the role of my engineering identity, as it was [repeatedly] questioned in this [EngEd] field, and the importance of, and the way in which to [concretely] formalize my engineering identity].*

Researcher 4: *[I] always needed to ‘explain.’ [I] always wanted to qualify the survey questions, and provide participants the opportunity to explain their particular circumstance, as I always felt the need to explain my own circumstances, and how I got to where I am; perhaps because I feel I don’t fit into the ‘box’?*

This theme of an identity quandary is demonstrated through our desire to belong to the community of EngEd. We question the legitimacy of the field, and therefore, we question our own legitimacy. This response could be due to the nature of our community in Canada, which is one in development; or it could be unique to our research team, perhaps the catalyst that has

drawn us together to explore the identity of graduate EngEd students in Canada. One of the prevalent abstracted themes in the larger data set was coded as ‘no established/typical community,’ which evolved from the in vivo code, ‘no home.’ The metaphor of home lends the interpretation of the findings to the theoretical lens of situated learning, and Lave and Wenger’s conceptions of legitimate peripheral participation and community of practice^{2,32}. What happens when there is no established community of practice? How do novices negotiate ‘insider’ status? How are their practice-linked identities formed?

In our study, we found that we are questioning or needing to explain our legitimacy and our participation in the community the longer we are in it; that we are uncomfortable letting go of our preceding identities because we are unsure whether there is a defined identity into which to transition. Simultaneously, we are working in a world that (for some of us) asks us to have both of these identities, never formally allowing us to transition. Another shared theme across our data was our implicit belief that we must let go of one identity in order to assume another. We did not expect ‘engineer’ and ‘engineering education researcher’ to be competing identities.

Perhaps what we are experiencing is because our community of practice is fledgling, and in some of our institutions, non-existent. As a result, we are identifying with a broader community-at-large of engineering educators and engineering education researchers. Our EngEd communities of practice are for many of us not lab or research groups, or students and faculty with similar interests and skills residing at our institutions, but a national community of people who convene once a year at our annual conference, CEEA (Canadian Engineering Education Association), and for some of us, at international conferences such as ASEE (American Society of Engineering Education). While a few of the relationships we develop transcend a yearly get together, and some of us have found peers/mentors in our home institutions or from other institutions, the connection to the community of practice is not constant, nor pervasive. Thus, we may find one community to connect with in our day-to-day academic activities, and another to develop or confirm our identities as EngEd graduate students and researchers that we access less frequently.

7. Conclusions and Next Steps

Through the process of addressing our dual roles as both as researchers and participants, and of attending to the quality of our interpretive EngEd research, four EngEd graduate students from separate institutions across Canada conducted a collaborative autoethnography. We explored how our roles and potential biases influenced our research study to investigate the identities of the graduate student population engaged in EngEd scholarship in Canada. We position our study within Walther, Sochacka, & Kellam’s process-oriented framework for interpretative research, identifying our roles, influences, and biases in order to develop a deeper understanding of the social system we are investigating, and develop methodological awareness to make transparent the subsequent generation of knowledge.

Our analyses suggest that the undeveloped community of practice we are experiencing is leading to an identity quandary for us as EngEd graduate students in Canada. We are questioning the legitimacy of our identities, and of the field. As we look to our larger study, we will establish pragmatic validation by determining whether our application of the theoretical lens of situated learning and our subsequent interpretations are significant to the participants in the larger social context that we are investigating. As we work to describe the identities and experiences of our

EngEd graduate students in Canada, we look forward to generating knowledge regarding our similarities and diversities, both in Canada, and comparatively, beyond our borders.

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