The power and usefulness of qualitative research over other types of research inquiry comes from its unsurpassed ability to explain process and reveal complexity (Creswell, 2013; Maxwell, 2013). While quantitative researchers tend to be interested in numerically representing characteristics, variables, or concepts of interest (see Hjalmarson & Moskal, 2018 for quality considerations in quantitative research), qualitative researchers more often focus on people, relationships, situations, events, and processes (Maxwell, 2013). Many believe qualitative research can reveal the bigger picture often missed in quantitative research (Alasuutari, 2010; Maxwell, 2013). Given the recent recognition of qualitative research, we have begun to see an increase in this approach to inquiry, particularly in engineering education. Because our ultimate goal is to encourage engineering education researchers interested in qualitative methodologies to develop their unique “ways of being” and “ways of knowing” as qualitative researchers, we attempt to draw together flexible standards for the dissemination of engineering education’s qualitative research in this editorial.

Motivation

Before becoming an Associate Editor for the Journal of Engineering Education (JEE), I (Nadia is the first person source of the stories in this guest editorial) often thought that JEE was not very open to publishing qualitative papers. Sometimes the feedback and reviews on papers from the engineering education community pointed more to the reviewer’s misunderstanding of the purpose of qualitative research. They seemed to only value research that was generalizable. Qualitative research, which is typically context-specific and not generalizable to broader populations, would therefore never meet this requirement (Willig, 2012). Thus, my frustration grew over time.

As I began my role as an Associate Editor in January 2016, I began to see a different perspective. Most of the manuscripts I handle are qualitative papers, and I noticed patterns in many of them. For example, many papers included a generic boilerplate or otherwise cursory description of methods. This lack of detail did nothing to provide insight into how the research was conducted and even less on how the work could be replicated. Many of JEE’s reviewers would critique these points in their reviews and then not recommend the manuscript for publication. Even those reviewers who did not point specifically to methods would suggest that they did not find the work to be trustworthy or valid, a concern that could have been allayed with more details about how the research was actually undertaken. Rarely did we get a reviewer critiquing implied assumptions of the work’s qualitative nature. In
addition, reviewers infrequently recommended that a paper should not be published because of too few participants or doubts over the value of its contribution.

In my time as Associate Editor, I have also co-authored many submitted manuscripts. While I still see more of these manuscripts rejected than I would like to admit, I now recognize that the manuscripts are not rejected because of flaws in the fundamental research design or because the studies are qualitative in nature. Rather, those rejections stem mostly from weaknesses in two integral components of qualitative research: the theoretical framework(s) and the methods. My team and I would often fail to explicitly demonstrate how our theoretical framework aligned with the research design, the analysis of the data, and the implications. Similarly, our manuscript lacked an in-depth description of the methods to the readers. As we became steeped in the arduous task of dissemination, it was easy to gloss over methods sections without providing ample detail for new readers to understand participant selection, data collection, data analysis, and subsequent conclusions. In reflecting on this process, the reviewers were correct in holding us to a higher standard and pushing us to provide sufficient details. Through those details, readers would better understand how we arrived at our conclusions, the specific context of our research, and our subjectivities as researchers. All of these are critical in providing the reader with the needed level of detail when gauging the trustworthiness or validity of our study.

In light of our lessons learned, this editorial will explore some considerations when designing a qualitative research project, implementing that project, and, ultimately, preparing manuscripts for dissemination. In particular, we will discuss considerations for preparing manuscripts describing qualitative engineering education research. Central to our argument is that, while calling attention to quality within *JEE* qualitative manuscripts, we are not arguing for one right way (e.g., "*JEE*’s Foolproof Formula for Publication") for writing a qualitative manuscript. Or, put differently, we believe it is important to support standards, but never the need for standardization in qualitative research. This means that we wish to draw up loose dissemination guidelines that will uphold quality, while neither constraining the unique contributions of various modes of qualitative inquiry, the range of ontological and epistemological assumptions underlying these divergent modes, nor the development of the field in general. Instead, we recognize that there are multiple ways that a qualitative manuscript can be prepared. As such, our aim is not to privilege only one way of conducting qualitative research, but to ensure all types (e.g., narrative inquiry, ethnography, case study research, participatory action research, phenomenological works, grounded theory, and post-qualitative innovations) a greater chance of reaching a broader readership. In the end, quality standards of dissemination can help the field of qualitative research grow in more “publishable” ways that get this powerful work out into the community.

**Considerations in the Pursuit of Quality Qualitative Research Manuscripts**

What does this mean for our community? How can we, as a community, create trustworthy qualitative journal articles while encouraging a multiplicity of ways of disseminating our diverse research projects? Drawing on sample methodological manuscripts on conducting and disseminating qualitative research from within and outside the boundaries of our research community, we will discuss below considerations when developing qualitative research projects.
What About My Role in Qualitative Research? Is it Biased?

We argue that it would benefit many of us, as qualitative researchers, to examine our own subjectivities. Many of us have formal training and backgrounds in science and engineering. With this training comes an assumption that we should strive for objectivity. While most engineering education qualitative researchers have transitioned from goals of objectivity to acknowledging subjectivities in dissemination efforts, we call for a similar level of transparency throughout the entire research process. Here, we draw on Peshkin’s (1988) article, “In Search of Subjectivity — One’s Own,” and his recommendations for researchers. While acknowledging that one’s subjectivity can lend meaning to qualitative data interpretation, Peshkin suggests that researchers engage in “a formal, systematic monitoring of self” (1988, p. 20). This could take different forms throughout the entire research process: writing memos on subjectivity, writing (and revising) a subjectivity statement, recording voice memos in which you discuss aspects of your subjectivity, or including discussions of subjectivity in research team meetings. Considering subjectivity throughout the research process helps us, as qualitative researchers, to better manage our ever-changing subjectivities as well as our complex and intertwined relationships with our participants (Peshkin, 1988). As Maxwell (2013) explains, our goal is not to simply minimize our influence, but to consider how our influence affects not only what interviewees say but also the validity of the conclusions we draw from the study.

What Is a Theory and How Can I Effectively Integrate a Theoretical Framework?

In our discussion of theory we draw primarily from Maxwell (2013), who defines a theory as a model or map that helps us understand “why.” Seen this way, theory is not only a framework but also a story that helps explain what is happening and why it happens. Maxwell explains, “A useful theory is one that tells an enlightening story about some phenomenon, one that gives you new insights and broadens your understanding of that phenomenon” (2013, p. 42). When using theory in qualitative research, one can either pull from existing theory or develop theory grounded in and emerging from the data and analysis in a study or series of studies. Existing theory can be either “big T” theory drawn from grand theories well-established in the literature (e.g., critical theory, self-efficacy theory, and expectancy value theory) or “little t” theory pulled from everyday theories, such as a relationship between two concepts or characteristics.

In Maxwell’s (2013) discussion of the varying uses of existing theory, he provides two metaphors that explain how theory can be used in qualitative research: theory as a coat closet and theory as a spotlight. When theory is described as a coat closet, with concepts of the theory as the hangers and data being hung on the hangers, it helps researchers make connections and reveal relationships between pieces of data. Conversely, if the theory does not align well with the data, the researcher may not be able to hang the data on the hangers and thus cannot provide new insights or deeper understanding of the data. This situation would suggest that another theory (with its associated set of “hangers”) may be needed that better aligns with the data. Theory can also serve as a spotlight, illuminating data and relationships that would otherwise go unseen or misunderstood. As such, Maxwell warns that no single theory can brighten all of the data; thus the act of choosing a theory will leave some data in the dark.

Regardless of the divergent uses of theory and the varying epistemological views (i.e., ways of knowing) or ontological understandings (i.e., ways of being) that underpin one’s theoretical framework, engineering education’s qualitative research should aspire to a
summative and synergistic whole. This means that your theoretical framework should help “frame” your entire argument. Though made up of many sections, a manuscript should become greater than or different from the piecemeal combination of these sections (Maxwell, 2013; Smagorinsky, 2008). Accordingly, the gestalt of the argument hinges upon effective alignment across the paper’s major sections (Smagorinsky, 2008). Oddly enough, this cohesion is least likely achieved through a linear process, whereby one writes the theoretical framework first, then the methods, and last the results. Rather, we argue for a back-and-forth recursive process, such that all sections “talk” to one another. Through this iterative process, authors may find it easier to identify an intersection between the theoretical framework and methods to thus generate an altogether unique “theory-methods” package. Likewise, the authors’ resultant claims (and their concluding explanations) will follow from the data analysis within the methods. Lastly, to show how the conclusion answers the research questions, these guiding research questions should resurface in the manuscript’s final section.

What Should I Include in My Methods Section? How Detailed Should It Be?

With the understanding that there is neither a set way of conducting qualitative research in engineering education nor a standardized language of quality, we can suggest some general categories to include within a methods section. To accomplish this goal, we draw loosely from Smagorinsky’s (2008) article about how methods can serve as the core of a manuscript. We expect a methods section to include the context of the research, data collection, data analysis, and data reduction. Smagorinsky posits that establishing the context of the research (e.g., researcher positionality, research site, and cultural/linguistic aspects) is needed to situate the research findings. Moreover, providing sufficient detail in terms of data collection, which often includes describing (rather than listing) data sources and how these data were collected, will help reveal replicable steps in the making of the data. In addition, Smagorinsky calls for sufficient detail in a manuscript about the data analysis, such that readers can understand and replicate its various sequential steps or stages. In particular, data reduction, whereby one organizes the larger data corpus into a subset of representative patterns, trends, or themes, is a critical and necessary final stage for most research that often is ignored.

How Can I Tell if My Conclusions Are Valid? Do We See What We Think We See?

As discussed at the beginning of this editorial, negative reviews of qualitative research articles can emerge when the reviewer cannot easily assess the validity of the research process and, subsequently, is not convinced of the findings and implications for practice. Many authors tend to talk about validity issues and strategies in generic and general terms. For example, they discuss member checks and triangulation without sharing the specific validity concerns these strategies address and/or stating how these strategies were actually used and integrated into their study. Foremost, we believe that considering validation throughout the research process is central to increasing the trustworthiness of qualitative research projects. For this discussion, we draw on Walther, Sochacka, and Kellam (2013) as well as Maxwell (2013).

In our 2013 article, Walther, Sochacka, and I (Nadia) discussed quality in qualitative research using a metaphor of total quality management adopted from industry. Later this metaphor was referred to as the quality framework. The article’s underlying idea was to consider quality throughout the entire research process, from earlier stages in the research project where we are “making the data” to later stages of “handling the data.” This approach encourages researchers to consider multiple aspects of validity and reliability: theoretical validity, procedural validity, communicative validity, pragmatic validity, process reliability, and ethical
validity (Sochacka, Walther, & Pawley, 2018; Walther et al., 2013, 2017; Walther, Pawley, & Sochacka, 2015). These different processes of validity and reliability provide a multipronged approach to thinking about research quality that allows authors to deeply consider and reflect on validity and reliability issues throughout the research process.

Many authors have begun using this quality framework effectively when discussing quality in their own qualitative research projects (Huff, Zolowski, & Oakes, 2016; Kirn & Benson, 2018; Wilson-Lopez, Mejia, Hasbún, & Kasun, 2016). Others have misused the quality framework as a simple checklist instead of a way of comprehensively considering quality throughout a project. The checklist approach simultaneously reveals a one-size-fits-all treatment of quality and a shallow or even posthoc treatment of quality that begs for deeper consideration of quality throughout the research project. Similarly, Maxwell (2013) discusses the importance of using and incorporating validity strategies into research projects, instead of simply naming them in manuscripts. He argues that we need to decide on the specific validity threats likely to be present in an individual study, to align strategies with these validity threats, and to describe what the validity threats and research strategies really mean to our specific studies as we disseminate our findings.

Adding to this quality framework, Maxwell (2013) provides specific strategies to reduce validity threats and increase the trustworthiness of conclusions. Some of these strategies include intensive long-term involvement in data collection sites, rich data collection, respondent validation (also called member checks), searching for discrepant evidence and negative cases, as well as triangulation. While many strategies exist to reduce validity threats, it is problematic to simply pick from them and list them in a manuscript. It is best to consider how the validity threats are specific to the study, to align appropriate strategies with these threats, and to describe these validity threats and strategies explicitly.

Conclusion

In conclusion, we propose flexible standards for conducting and disseminating qualitative research. While not advocating for one correct way of conducting or disseminating qualitative research, we have provided some points to consider when embarking on a new qualitative research project. For those who are interested in honing their skills as qualitative researchers, those interested in beginning their first qualitative research project, or those pushing the boundaries of qualitative research methods, we encourage you! In doing so, we recommend the works referenced in this article (Maxwell, 2013; Peshkin, 1988; Smagorinsky, 2008; Walther et al., 2013). These readings will assist you when developing a research proposal that answers interesting research questions, when considering aspects of quality throughout the research process, and, eventually, when advancing our knowledge in engineering education. In this way, under the large umbrella of qualitative research, we can forge ahead with goals of developing complex and nuanced understandings needed to improve the current and future state of engineering education.

References


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