Work In Progress: Considering the Impact on Research Quality of a Team Approach to Phenomenography

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WIP: Considering the Impact on Research Quality of a Team Approach to Phenomenography

Introduction

This WIP paper describes a team approach to phenomenography on ethical engineering practice in the health products industry and its potential impact on research quality. Although qualitative researchers often conduct phenomenography collaboratively, most often a single individual leads the data collection and analysis; others primarily serve as critical reviewers. However, quality may be enhanced by involving collaborators as data analysts in "sustained cycles of scrutiny, debate and testing against the data" [1, p. 88], thus interweaving unique perspectives and insights throughout the analysis process. Nonetheless, collaborating in this intensive data analysis process also presents unique challenges. In this paper, we (1) describe the processes we are applying in an integrated team-based phenomenographic study, (2) identify how the team approach affects research quality, and (3) reflect on the challenges inherent to this process.

We ground this reflective case study in the methodological literature on phenomenography. Our team strategies include multiple interviewers (and, when possible, two interviewers per interview), team communication through reflective memos, and integration of individual and team-based data analysis with peer critique of individual analyses. We compare our team approach with typical individual phenomenographic approaches, and we align our procedures with the five strategies of the Qualifying Qualitative Research Quality Framework, or Q^3, designed by Walther, Sochacka, and Kellam [2]. In aligning strategies, we consider benefits and trade-offs.

Individual and Team Approaches to Phenomenography

The theoretical framework and research procedures of phenomenography are derived from the work of Marton and Booth [3] and Bowden and Green [1]. The framework assumes a non-dualist stance based on a relational view of the world in which internal and external views of the world are interconnected. The product of phenomenography is an *outcome space* which consists of *categories of description*, or qualitatively different ways of experiencing the phenomenon, that are logically related to each other, "typically as a hierarchy of structurally inclusive relationships" [4, p. 323]. Table 1 compares individual phenomenography in engineering education research [5-8] with our team approach.

Table 1. Comparison of Individual and a Team Approaches to Phenomenography

Aspect	Individual Approach	Our Team Approach
Number of Interviewers	One	Four
Number of Interviews	20-30	42 (plus four pilots)
Number of Analysts	One	Seven
Expertise of Analyst(s)	Expert/Near Expert	Novice to Expert
Number of Critics Involved	1-3	All
Critics' Knowledge of Data	Limited	Comprehensive
Interdisciplinary Expertise	None (or minimal)	Yes (broad)

Research Quality in Phenomenography

Walther et al. [2] argued that quality should permeate all aspects of the research design. They developed the Q^3 framework to help "address the issue of the lack of a coherent and systematic way of conceptualizing research quality throughout a specific inquiry" (p. 628). The Q^3 typology includes five quality strategies: (1) theoretical validation, (2) procedural validation, (3) communicative validation, (4) pragmatic validation, and (5) process reliability. This approach to quality both extends and resonates with traditional approaches to quality in phenomenography, which emphasize rigor, variation, and thoroughness throughout the entirety of the research process, including the design phase, participant selection, data collection, analysis, and reporting [9-14]. Quality strategies seek to ensure that results are defensible to external research and participant communities and useful to the intended audience [6, 10]. Here, we reflect on our team-based approach by considering the five Q^3 strategies [2] and literature on phenomenography.

Theoretical Validation

Theoretical validation refers to whether "concepts and relationships of the theory appropriately correspond to the social reality under investigation" [2, p. 640]. In phenomenography, the objective is to develop a theory that is true to individual's lived experiences but also captures the relationships (and variation) between the individual and the population [1, 3]. A priori, researchers strive to identify key factors that may affect ways of experiencing the phenomenon and to recruit participants who represent all aspects of variation. During interviews, researchers focus on participants' ways of experiencing the phenomenon, rather than their own prior conceptions. During analysis, they scrutinize individual participant's way of experiencing a phenomenon and then examine connections and variations between participants.

Our team approach has not differed in theoretical aspects from individual phenomenographic studies, but the implementation has. For example, we initially identified more key factors of sample variation (nine) than is typical, which may be attributed to our team's interdisciplinary nature. While this broadened set of factors has led to a larger sample than is typical and diverse initial interpretations of the data, we anticipate that by negotiating individual interpretations, we will attain a more robust and theoretically valid understanding of ethical engineering practice. However, the negotiation process is time-intensive, and adds to the already time-intensive process of phenomenography. Further, the larger sample presents additional data management concerns to those already inherent in phenomenography [10].

Procedural Validation

Procedural validation refers to how "features of the research design improve the fit between reality and the theory generated" [2, p. 641]. In phenomenography, researchers must ensure that "the focus of the research is maintained on the object of study, or the relation between the subjects and the phenomenon, rather than on the researcher's own relation to the phenomenon" [1, p. 12-13]. The approach assumes that researchers' relations to the phenomenon and to the participants affect both data collection and data analysis. Therefore, it is essential to acknowledge and to mitigate the potential confounding influence of such relationality when one or multiple researchers are involved. During interviews, researchers must ensure that participants can accurately and

thoroughly share their perspectives and experiences of the phenomenon. The analysis process requires that the researchers immerse themselves in the data, reading and re-reading transcripts numerous times, and continually revisiting the transcripts as they categorize, re-categorize, interpret, and narrate the results. Throughout this process, the researchers must ensure that analysis and reporting are rooted in participants' accounts and *not* influenced by the researcher's personal values, prior understandings, or experiences related to the phenomenon.

We have identified three specific considerations related to procedural validation. First, researchers must decenter, focusing on the participants' views alone and deemphasizing prior knowledge of theoretical frameworks throughout the entire process. The four interviewers and seven analysts bring different biases, but thorough team negotiation allows us to identify and mitigate these biases and root findings in the participants' social reality. Second, one of the central tenets of phenomenography is that participants represent "a collective group, rather than as a series of individuals" and that categories are established "from an analysis of all of the transcripts, as a group" [1, p. 81]. To overcome variable interpretations of subsets of the data, we are finding that all analysts will need to immerse themselves in the entire dataset, like a single analyst. Finally, the team approach requires all members to make themselves more vulnerable to peer critique beyond what is typically required when one person is the primary analyst. We have found that establishing mutual trust is crucial, and each of us must provide candid feedback to achieve procedural validation.

Communicative Validation

Communicative validation refers to whether the study relies on "knowledge socially constructed within the relevant communication community" [2, p. 640]. Phenomenographers try to capture the reality and perspectives of participants and relevant communities. In collecting data, they focus on developing a transparent and empathic relationship with the interview participant so they may understand the participant's social context, which enables the interviewer to ask nuanced and applicable follow-up questions [15]. In reporting the analyses, the researchers focus on ensuring that findings withstand exposure to the relevant research communities [10].

A complicating factor in this study is the diversity of participant and research communities. First, participants were recruited from multiple companies, each with a different market niche and corporate culture. The participants included biomedical engineers, mechanical engineers, electrical engineers, and project managers. It is unclear how variation will resonate with these diverse communities. Second, the interdisciplinary expertise of our team brings knowledge of multiple research processes and variable prior conceptions of ethics. Our team's diversity may expand communicability with broader participant and research communities, but it requires careful negotiation as we situate data interpretations and findings within those communities.

Pragmatic Validation

Pragmatic validation refers to whether the "concepts and knowledge claims withstand exposure to the reality investigated" [2, p. 640]. Phenomenographic studies ought to generate practical meaning and utility in the target social context. To check if our results are pragmatically valid, we might ask, "Do these results resonate with the interview participants?" or, "Do they suggest

actionable benefits?" While our study is not yet advanced enough to establish pragmatic validity, we will evaluate this validity by gathering feedback at conference presentations and workshops, through our academic and industrial advisory boards, and via other dissemination modes.

Process Reliability

Process reliability aims to make "the research process as independent from random influences as possible" [2, p. 641]. Process reliability is especially important in phenomenography because the interviews are semi-structured and the analysis is inductive. The processes for participant sampling, data collection, and analysis must be well-structured, well-justified, and checked by external experts. Still, phenomenographic interviews and analysis are often nuanced by tacit understanding, which may lead to inconsistencies between researchers [9].

We employed several strategies to support process reliability, such as rigorous team development of the interview protocol, peer critique of four pilot interviews, interviewer reflection memos to communicate with the team, and development of heuristics to guide decision-making among interviewers. In addition, our analysis process includes seven independent analysts. These strategies have helped to manage the volume of data, as different researchers initially focused on different subsets of the data during initial analysis phases and, as a further benefit, has led to myriad approaches to and perspectives on preliminary category formation and description. Nonetheless, process reliability remains a concern. For example, even though guidelines were built into the interview protocol, variability across our three different lead interviewers persisted. Some of this variation, e.g., unique follow-up questions, may have expanded consideration of key facets of the participants experiences, thus improving theoretical validation, while other variation may have de-emphasized facets that allow comparison across participants' experiences. In addition, the diversity of approaches and interpretations in analysis led to substantively different initial categorizations. We must continue to collaboratively negotiate these interpretations as we seek to develop a collective understanding of ethical engineering practice grounded in the data.

Conclusion

We hope that this reflective piece will serve to guide future researchers who are considering implementing a phenomenographic research design, either individually or in a team. Howsoever it is implemented, phenomenography is a time-intensive research process. While including more researchers in the design, interpretation, and reporting of results may improve research quality, it also raises unique challenges. As a team, we continue to negotiate our research process as we grapple with the distinct interpretations of the data. By utilizing Walther et al.'s Q^3 framework [2], we continue to identify how team-based phenomenographic approaches can support the quality of our research endeavors.

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