Engineering Education Transformations Institute
UNIVERSITY OF GEORGIA

Learn how to design high-quality qualitative educational research!

A workshop for disciplinary STEM faculty, by disciplinary STEM faculty

2023 Frontiers in Education (FIE) Conference

John R. Morelock, Ph.D.
Engineering Education Transformations Institute
University of Georgia
Athens, GA, USA
john.morelock@uga.edu

Michelle Jarvie-Eggart, Ph.D.
Engineering Fundamentals
Michigan Technological University
Houghton, MI, USA
mejarvie@mtu.edu

Heather Chenette, Ph.D.
Chemical Engineering
Rose-Hulman Institute of Technology
Terre Haute, IN, USA
chenette@rose-hulman.edu

Sara Hooshangi, Ph.D.
Computer Science - Northern Virginia Center
Virginia Tech
Washington, D.C., USA
shoosh@vt.edu

Betsy Chestnutt, Ph.D.
Engineering Fundamentals
University of Tennessee Knoxville
Knoxville, TN, USA
bchesnut@utk.edu

Sarah Wilson, Ph.D.
Chemical Engineering
University of Kentucky
Lexington, KY, USA
s.wilson@uky.edu

Azadeh Bolhari, Ph.D.
Environmental Engineering
University of Colorado Boulder
Boulder, CO, USA
azadeh.bolhari@colorado.edu

Kirsten Dodson, Ph.D.
Mechanical Engineering
Lipscomb University
Nashville, TN, USA
kirsten.dodson@lipscomb.edu

Iglika Pavlova, Ph.D.
Department of Biology
University of North Carolina Greensboro
Greensboro, NC, USA
ivpavlov@uncg.edu

Rebecca Reck, Ph.D.
Bioengineering
University of Illinois Urbana-Champaign
Champaign, IL, USA
rreck@illinois.edu

Workshop Goals

By the end of today's workshop, you will be able to:

1. Apply the **ProQual Approach t**o design high-quality qualitative, educational research.
2. Construct the foundation for a qualitative research study, in the form of a well-defined **Social Reality Under Investigation** (SRUI)
3. Articulate components of qualitative research quality using the **Qualifying Qualitative Quality (Q3) Framework**.
4. Access the ProQual educational research community, who will help interested participants continue to develop their research ideas beyond the workshop.

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Primer: The ProQual Approach to Qualitative Research Design

The premise of the ProQual Approach is that learning to conduct high-quality qualitative research should begin not with an overview of approaches, theories, and methods. Rather, it begins by identifying and answering the right questions to design studies from the ground up with quality in mind. We call this approach a "methodologically unencumbered" introduction to qualitative research. The first objective in research design is identifying a **social reality under investigation (SRUI)**, which clearly defines the boundaries of the problem or phenomena that will be studied. Drafting a properly scoped investigation of a well-defined SRUI is the most critical first step in research design, and other decisions involved in the conduct of qualitative research flow more easily from there. Figure 1 below shows a high-level overview of the entire ProQual Approach visually.

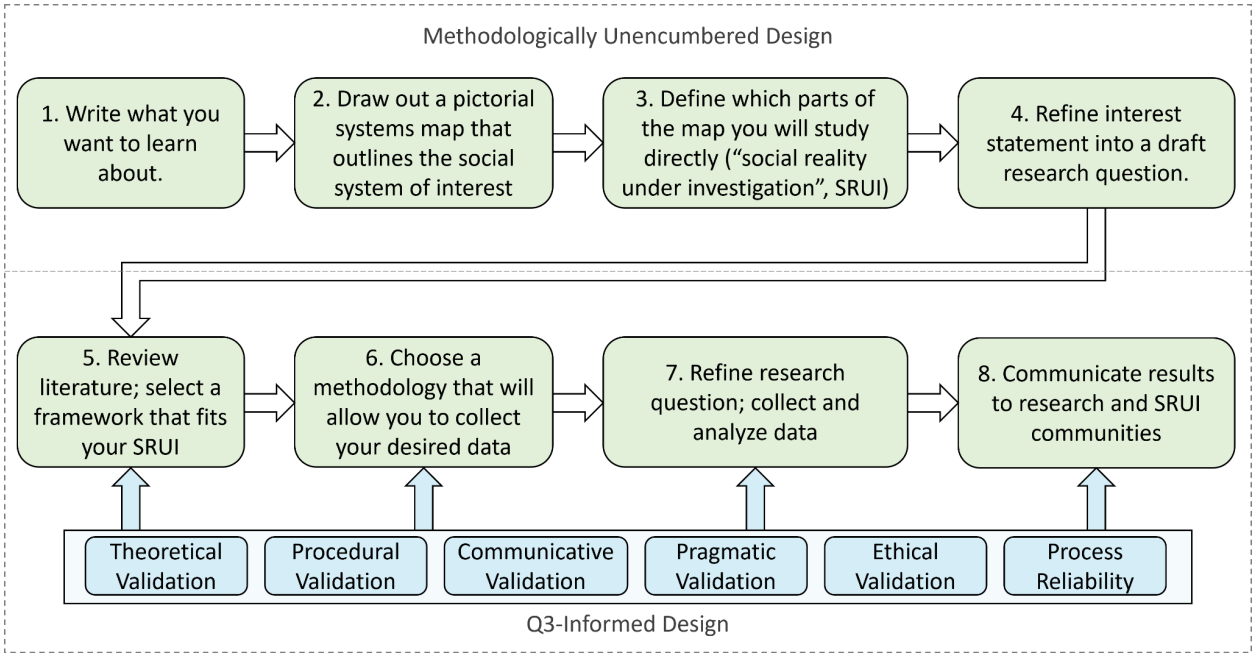


Figure 1: Flowchart Representation of the ProQual Approach to Qualitative Research Design

This workshop focuses primarily on providing you with examples and practices aligned with "methodologically unencumbered" processes in the top half of the figure, with a special emphasis on the pictorial systems map as tools to identify a SRUI.

Primer: Pictorial Systems Maps

Before we can select a social reality to investigate, we must first define the *social system* that exists around our topic or context of interest. For example, if we want to investigate the mental health of undergraduate engineering students, we first must enumerate various factors that might affect such a student's mental health. **Pictorial systems maps** allow us to visually capture the various systemic factors that influence the things, places, and people we are interested in studying. Once the map is drawn, we can then "zoom in" on particular parts of it we find of particular interest to form our SRUI and draft a well-defined research question—while also acknowledging that our study takes place in a complex social system influenced by a variety of other factors. High-quality qualitative research does not seek to capture *everything* that can be studied, but to define a study with a clear scope while recognizing the limitations of the study by acknowledging what is not being investigated.

Building on the mental health example, Figure 2 (built step-by-step during the workshop) provides an example of a pictorial systems map capturing factors that might affect student mental health.

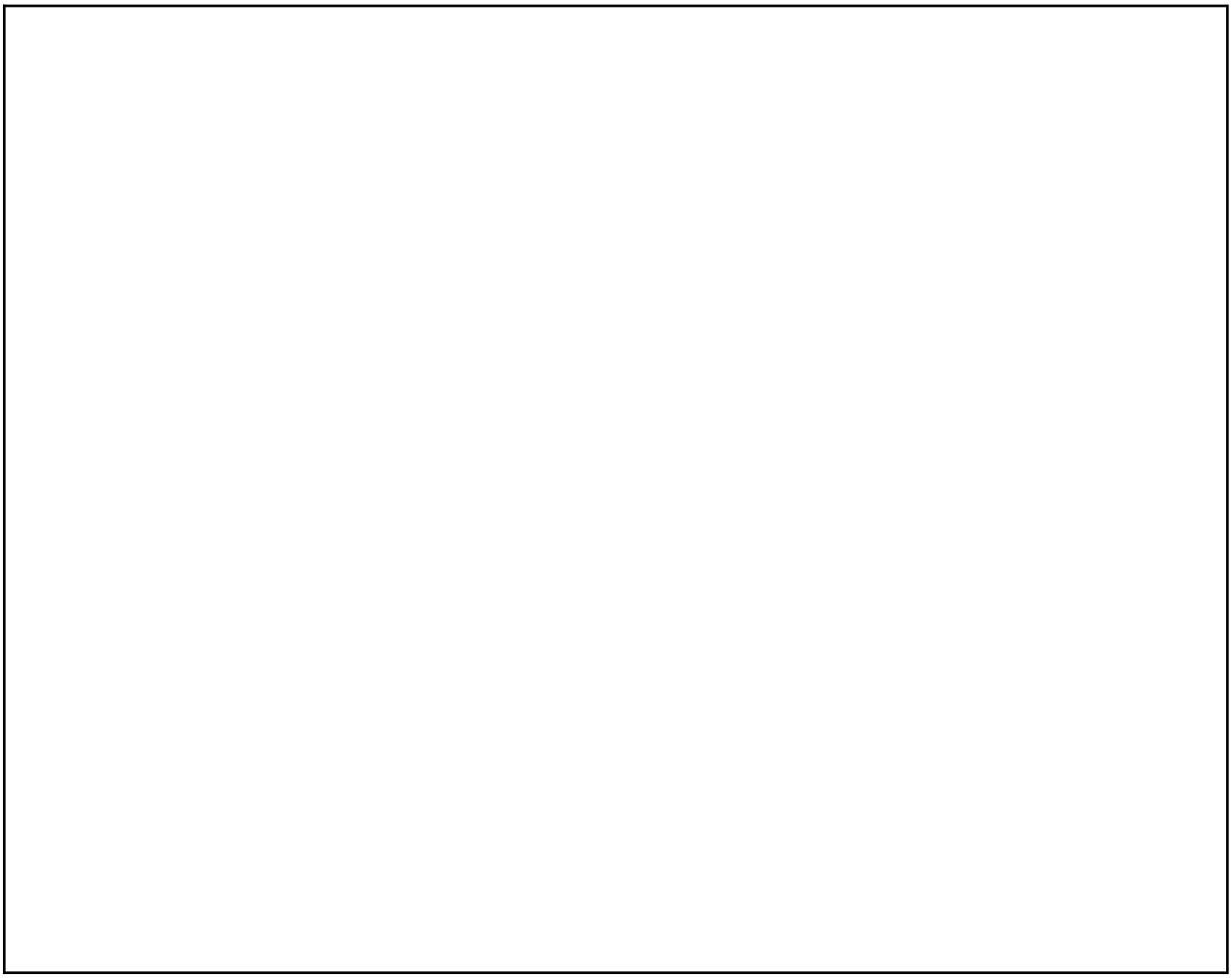
Figure 2: Example pictorial systems map around engineering student mental health

The map in Figure 2 covers a wide variety of experiences and factors that might have an impact on a student's mental health, including their living environment and extracurricular habits (top-left), support systems and health professionals that students may or may not have access to (bottom-left), institutional structures and academic progress (top-right), academic and classroom experiences (middle-right), and social support (bottom-right). A well-scoped qualitative study will pick a subset of these factors to understand in greater depth through systematic investigation.

Activity: PBL Pictorial Systems Map Draw-Along

After the mental health example, we will collaboratively begin building a pictorial systems map for an instructor that is interested in exploring the impacts of problem-based learning (PBL), based on the following prompt:

I have gradually transitioned my course to a problem-based format. Having taught the course over a number of years, I've noticed that exam performance and course evaluations initially dipped but then have steadily improved. This trend and my experience of teaching the class in this format made me curious and I decided that I want to research the impacts of PBL on learning.



Activity: Drawing your own pictorial systems map

Now that you've had a few examples of drawing a pictorial systems map, try drawing one yourself! You can either draw a map for a research project you are currently considering, or choose one of the following prompts:

1. Continue the PBL map started above
2. You want to understand factors that influence student communication skills.
3. You are interested in how co-op experiences impact student self-efficacy.
4. You want to understand how students think about sustainability.
5. You want to know how student experiences influence their career goals.

Use the space below to jot down notes or ideas for your map, or to sketch it out before drawing with markers on the big sticky notes!

Primer: The Qualifying Qualitative Research Quality (Q3) Framework

Once the SRUI is defined and a research question drafted, the next steps of the ProQual approach (the bottom half of Figure 1) will help you determine how to collect and analyze data, guided by the Qualifying Qualitative Research Quality (Q3) framework. This framework presents qualitative research quality as an essential and context-sensitive consideration in every aspect of a study's design, rather than as a series of specific strategies that can be added to a research design to increase quality. It divides research quality into six forms of validation that must be considered in both the making (collection) and handling (analysis & communication) of qualitative data. Table 1 defines these dimensions in greater detail.

Table 1: Components of the Q3 Framework

Form of Validation	**Key Concern in Making Data**	**Key Concern in Handling Data**
Theoretical Validation	Does the research process wholly capture everything the researchers want to learn about the social reality under investigation?	Do researchers' interpretations fully reflect the coherence and complexity of the social reality under investigation?
Procedural Validation	Do the research procedures afford the researchers an authentic view of the social reality under investigation?	What processes are in place to mitigate the risks of the researchers misinterpreting the participants' lived experiences?
Communicative Validation	How is meaning co-constructed with participants to ensure that data represent participants' social realities on their own terms?	How is data co-constructed with research communities to build upon existing work while remaining authentic to research participants?
Pragmatic Validation	Is the selected theoretical framework a good fit for the social reality under investigation?	How meaningful are the study's results to the social reality under investigation (and other similar social realities?)
Ethical Validation	Is the study conducted reflexively, responsibly, and in the best interests of social reality under investigation?	Do the findings do justice to the social reality under investigation, and positively impact the people that comprise it (and other similar social realities?)
Process Reliability	How can random influences on the research process be mitigated, and how can the social reality under investigation be dependably captured or recorded?	How can the researchers demonstrate and document the dependability of their data collection and analysis approaches?

Activity: Conver-Stations – Q3 Components & Project Development

The workshop leaders will split up across 7 tables - one for each of the six Q3 Framework components to learn more about them by example, and one for those who have a particular research project in mind and want to discuss next steps to advance it. Join whichever table interests you most!

The space below is for you to take notes on your discussion.

Additional Readings & Resources

1. **Learn more about the ProQual Institute**: J. R. Morelock, D. May, A. Reid, A. Boyce, N. W. Sochacka, and J. Walther, "Impacts of the ProQual Institute for Research Methods: Building communities of technical STEM faculty for long-term engagement in educational research," presented at the ASEE Annual Conference, Baltimore, MD, June 25-28, 2023.
2. **Read the paper that introduced the Q3 Framework**: J. Walther, N. W. Sochacka, and N. N. Kellam, "Quality in Interpretive Engineering Education Research: Reflections on an Example Study," *Journal of Engineering Education*, vol. 102, no. 4, pp. 626-659, 2013.
3. **Please don't hesitate to reach out to any of the workshop leaders!** We want to help you continue to develop your research ideas or connect you with someone who can.
4. **ProQual dinner tonight (10/18) at 7:30 PM at Brazos Proper Texas Kitchen**. We'd love it if you joined us!

Want to learn more?

Sign up for the 8-week course!

Applications are open for the fall 2024 ProQual Institute for Interpretive Research Methods, led by its original creators, Drs. Jo Walther and Nicki Sochacka

Who: STEM educators, post-docs, and graduate students

What: 8-week online course facilitated by Drs. Jo Walther and Nicki Sochacka; weekly materials shared via Microsoft teams; chat channels for just-in-time, community-sourced questions and answers; access to a growing network of ProQual alumni

When: September 2 – October 30, 2024; Monday/Wednesday 4-5.30pm ET, 1-week break in the week of September 23

Cost: USD $3,500 per person; partial scholarships available for participants from resource constrained institutional contexts; reduced cost for multiple participants from a single institution

How to apply: Fill in the online application https://bit.ly/3PMV54A

Have more questions? Reach out to Nicki at nicolasochacka@proqualinstitute.com