

# Chapter 28

## Practical Wisdom of Tool and Task: Meeting the Demands of the Method with Digital Tools in Qualitatively Driven Mixed Methods Studies

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### ABSTRACT

*The purpose of this chapter is to explain the effective use of digital tools to display and analyze mixed methods data and to identify the challenges and possibilities of doing a qualitatively driven mixed methods study of technology use in education. To frame this chapter, examples from a qualitatively driven mixed methods study of doctoral students, which explored how the use of mobile technology affected engagement in the class experience, are presented. Additionally, the authors discuss the limits, implications, and possibilities of inductively driven mixed methods, while dealing with issues of academic rigor and trustworthiness using Morse and Niehaus's (2009) guidelines for mixed methods research design and the ways in which digital tools enhance rigor and trustworthiness.*

### INTRODUCTION

According to Morse and Niehaus (2009), “Mixed method design is a name given to research practices that have actually been conducted for decades,” but they are “often difficult to identify, as researchers tend to gloss over strategies that may be considered by reviewers to be incomplete” (p.10). And

even though quantitatively driven mixed methods studies have gained attention over the past decade, qualitatively driven studies are less prominent and harder to accomplish “because mixing paradigms means that the researcher is using contradictory assumptions and rules for inquiry” (p.9). Morse and Niehaus's (2009)

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*The definition of mixed methods is that the study consists of a qualitative or quantitative core component and a supplementary component (which consists of qualitative or quantitative research strategies but is not a complete study in itself). The research question dictates the theoretical drive, as either inductive or deductive, so that the onus is on the researcher to be versatile and completely switch inductive and deductive positions according to the need of the study. (p.20)*

Although a variety of terminology is used among mixed methods authorities (Creswell & Plano-Clark, 2007; Greene 2008; Tashakkori & Teddlie, 2010), Morse and Niehaus (2009) use the terms core component – represented by all caps QUAL or QUAN, and supplemental component – represented by lower case *qual* or *quan*, and combine them in a number of ways via a + sign (simultaneous) or an → symbol (sequential) to reflect the theoretical drive of the study. Using Morse and Niehaus's (2009) nomenclature, the data in this chapter are from a QUAL+*quan* study. The denotation indicates that the theoretical drive of the study was qualitative, the pacing of the components was simultaneous, data collection and analysis were independent, and results of the QUAL core component and *quan* supplemental component were fit together for analysis last, which is the point of interface.

With a possibility of eight different combinations of the core and supplemental components and “because mixing paradigms means that the researcher is using contradictory assumptions and rules for inquiry” (p.9), Morse and Niehaus (2009) stress that the researcher conduct an “armchair walkthrough” (p.35). This process is described as “deliberately envisioning your project and the alternative designs and all possible outcomes. It is imagining your project step by step, to foresee problems and the advantages and disadvantages of conducting your project using all available alternatives” (p.35). They further emphasize that through doing this “you will be able to see how

they will fit at the point of interface, and what your end product will look like. Now—diagram it!” (p.35). To support their readers, numerous flow charts are included in their book to illustrate mixed method design possibilities.

Because Morse and Niehaus (2009) caution that conducting and diagraming an armchair walkthrough is important to the conceptual design of the study and visualization process, using digital tools to illustrate, visualize, and diagram the process and section for the study of student use of mobile technology was a necessary and natural fit. Additionally, the use of the Technological Pedagogical and Content Knowledge Framework was an appropriate fit as a theoretical framework.

The framework of Technological Pedagogical and Content Knowledge (TPACK) “builds on Lee Shulman’s construct of pedagogical content knowledge (PCK) to include technology knowledge” (Koehler & Mishra, 2009, p. 60). This framework details the complex interaction of content, pedagogy, and technology as bodies of knowledge that together produce “the types of flexible knowledge needed to successfully integrate technology use into teaching” (p. 60). Harris, Mishra, and Koehler (2009) defined the areas of content knowledge, pedagogical knowledge, and technological knowledge as:

- **Content Knowledge:** Knowledge about the subject matter that is to be learned or taught, including, for example, middle school science, high school history, undergraduate art history, or graduate-level astrophysics.
- **Pedagogical Knowledge:** Deep knowledge about the processes and practices of teaching and learning, encompassing educational purposes, goals, values, strategies, and more.
- **Technological Knowledge:** Always in a state of flux—more so than content and pedagogical knowledge. This makes defining and acquiring it notoriously difficult.

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